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BEHAVIORAL ANTITRUST AND MONOPOLIZATION

*Maurice E. Stucke**

ABSTRACT

One hot topic is whether Google has violated the antitrust laws. Another important topic is how behavioral economics can enrich antitrust policy. This article examines two implications of behavioral economics on antitrust monopolization law. The article first discusses trial-and-error learning as an entry barrier. This is timely given the current debate over the entry barriers of the search engine market. The article next discusses behavioral exploitation to maintain a monopoly. The behavioral economics literature can help explain the European Commission's tying claims against Microsoft, why the Commission's original remedy failed, and the benefits and risks of the Commission's remedy involving its subsequent prosecution of Microsoft over Internet browsers.

JEL: L12; L11; L40; L41; L63; D42

I. INTRODUCTION

Behavioral economics “is now mainstream.”¹ Some time ago, the economics literature moved beyond the Chicago School's strong assumptions of perfectly rational market participants who pursue, with willpower, their economic self-interest. Over the past twenty years, the economic literature has increasingly recognized, and measured, how: (1) willpower is imperfect; (2) people will incur costs to punish unfair behavior; (3) people care about treating others, and being treated, fairly; and (4) biases and heuristics affect decision-making. Figure 1 shows the trends for the phrases “behavioral economics” and “neoclassical economic theory” based on a search of books on Google Books Ngram Viewer, which “displays a graph showing how... phrases have occurred in a corpus of books” between 1960 and 2008 for all English books.

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¹ Dan Lovallo & Olivier Sibony, *The Case for Behavioral Strategy*, MCKINSEY Q., Spring 2010, at 30.

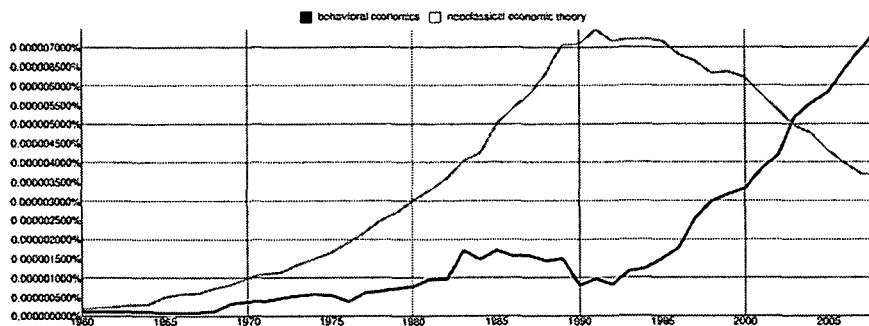


Figure 1. Trends for the phrases “behavioral economics” and “neoclassical economic theory,” 1960–2008

Source: GOOGLE BOOKS NGRAM VIEWER, <http://ngrams.googlelabs.com/info>.

On the consumer protection side, the U.S. Federal Trade Commission (FTC) many years ago recognized behavioral biases² and offered behavioral remedies.³ Today, organizations, including the Organisation for Economic Co-operation and Development (OECD),⁴ American Bar Association’s Section of Antitrust Law,⁵ Canada’s International Development Research Center,⁶ the British Institute of International and Comparative Law,⁷ and the American Antitrust Institute,⁸ are considering behavioral economics’ implications on antitrust policy. Competition officials at the

² See, e.g., *Arthur Murray Studio of Washington, Inc. v. Fed. Trade Comm’n*, 458 F.2d 622, 625 (5th Cir. 1972) (“The record is replete with trick advertisements to draw prospects, sham dancing analysis tests, relay salesmanship, some under secret electronic supervision by management, promises of social status and companionship, psychological sales techniques based on past unpleasant experiences (described as X-Factor or “past is black” technique). In many instances these tactics added up to cajolery and coercion. Many were reduced to tears.”); *Lichtenstein v. Fed. Trade Comm’n*, 194 F.2d 607, 611 (9th Cir. 1952) (the FTC can prevent the “‘pestilence’ of lotteries which ‘enters every dwelling . . . reaches every class . . . and preys upon’ and ‘plunders the ignorant and simple’”) (quoting *Phalen v. Virginia*, 49 U.S. 163 (1850)).

³ See, e.g., 16 C.F.R. pt. 429 (cooling-off periods).

⁴ Organisation for Economic Co-operation and Development, *Hearing on Competition and Behavioural Economics* (June 2012), http://www.oecd.org/document/43/0,3746,en_2649_37463_48742443_1_1_1_37463,00.html#Beh_Eco

⁵ Panel Discussion at 60th American Bar Association Section of Antitrust Law Spring Meeting, Washington, D.C.: Behavioral Economics in Antitrust and Consumer Protection Law (Mar. 2012); Panel Discussion at 59th American Bar Association Section of Antitrust Law Spring Meeting Behavioral Economics: Departing from the Rational-Actor Model? (Mar. 2011).

⁶ See, e.g., 5th IDRC Pre-ICN Forum on Competition and Development, Istanbul, Turkey (Apr. 2010).

⁷ Competition Law Forum on Behavioral Economics, British Inst. of Int’l and Comparative Law (July 2009), <http://www.biiicl.org/clf/clfmeetings2009>.

⁸ Ninth Annual Conference: The Next Antitrust Agenda, American Antitrust Institute (June 18, 2008), <http://www.antitrustinstitute.org/content/9th-annual-conference-next-antitrust-agenda> (audio recordings).

FTC,⁹ European Commission,¹⁰ and the United Kingdom's Office of Fair Trading¹¹ have accepted the limitations in neoclassical economic theory in depicting reality under all, or nearly all, circumstances.

Consequently, one topical issue is: how can behavioral economics enrich antitrust policy? Behavioral economics can inform our conception of competition. In relaxing the assumption of rationality (starting from the Chicago School's strong rationality assumptions), a more dynamic theory of competition emerges.¹² Firms compete to de-bias, better adapt, better innovate through iterative modifications to their products and services, and forge identities that maximize their workers' talents. Behavioral economics, as I discuss elsewhere, can inform the sources and risks of the market failure of cartels,¹³ mergers,¹⁴ and monopolies,¹⁵ and inform competition policy generally.¹⁶

⁹ See J. Thomas Rosch, Comm'r, Fed. Trade Comm'n, Behavioral Economics: Observations Regarding Issues that Lie Ahead, Remarks at the Vienna Competition Conference (June 9, 2010), <http://www.ftc.gov/speeches/rosch/100609viennaremarks.pdf>; J. Thomas Rosch, Comm'r, Fed Trade Comm'n, Managing Irrationality: Some Observations on Behavioral Economics and the Creation of the Consumer Financial Protection Agency, Remarks at the Conference on the Regulation of Consumer Financial Products (Jan. 6, 2010), <http://www.ftc.gov/speeches/rosch/100106financial-products.pdf>.

¹⁰ See, e.g., Emanuele Ciriolo, *Behavioural Economics in the European Commission: Past, Present and Future*, OXERA AGENDA (Jan. 2011); Eliana Garcés-Tolón, *The Impact of Behavioral Economics on Consumer and Competition Policies*, 6 COMPETITION POL'Y INT'L 145 (2010); Press Release, European Union Comm'n for Consumers, Why Consumers Behave the Way They Do: Commissioner Kuneva Hosts High Level Conference on Behavioural Economics (Nov. 28, 2008), <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1836&format=HTML&aged=0&language=EN>.

¹¹ Office of Fair Trading (UK), The Impact of Price Frames on Consumer Decision Making (2010), http://www.offt.gov.uk/shared_offt/economic_research/OFT1226.pdf; Matthew Bennett, John Fingleton, Amelia Fletcher, Liz Hurley & David Ruck, *What Does Behavioral Economics Mean for Competition Policy?*, 6 COMPETITION POL'Y INT'L 111, 118 (2010); Amelia Fletcher, Chief Economist, Office of Fair Trading, Address at the European Commission Consumer Affairs Conference: What Do Policy-Makers Need from Behavioural Economists? (Nov. 28, 2008), available at http://ec.europa.eu/consumers/conferences/docs/AF_presentation_en.pdf.

¹² Maurice E. Stucke, *Reconsidering Competition*, 81 MISS. L.J. 107 (2011).

¹³ Maurice E. Stucke, *Am I a Price-Fixer? A Behavioral Economics Analysis of Cartels*, in CRIMINALISING CARTELS: A CRITICAL INTERDISCIPLINARY STUDY OF AN INTERNATIONAL REGULATORY MOVEMENT (Caron Beaton-Wells & Ariel Ezrachi eds., Hart Publishing 2011); Maurice E. Stucke, *Morality and Antitrust*, 2006 COLUM. BUS. L. REV. 443 (2006).

¹⁴ Amanda P. Reeves & Maurice E. Stucke, *Behavioral Antitrust*, 86 IND. L.J. 1527, 1559 (2011); Maurice E. Stucke, *Behavioral Economists at the Gate: Antitrust in the Twenty-First Century*, 38 LOY. U. CHI. L.J. 513 (2007).

¹⁵ Maurice E. Stucke, *How Do (and Should) Competition Authorities Treat a Dominant Firm's Deception?*, 63 SMU L. REV. 1069 (2010); Maurice E. Stucke, *Should the Government Prosecute Monopolies?*, 2009 U. ILL. L. REV. 497 (2009).

¹⁶ Maurice E. Stucke, *Is Intent Relevant?*, J.L. ECON. & POL'Y (forthcoming 2012), available at <http://ssrn.com/abstract=1992761> or <http://dx.doi.org/10.2139/ssrn.1992761>; Maurice E. Stucke, *The Behavioral Antitrust Gambit*, in INTERNATIONAL RESEARCH HANDBOOK ON COMPETITION LAW (Ariel Ezrachi ed., Edward Elgar Publishing forthcoming 2012);

This article examines two implications of behavioral economics on anti-trust monopolization law. Part II discusses trial-and-error learning as an entry barrier. This is timely given the current antitrust investigations of Google, and debate over the entry barriers of the search engine market. Part III discusses behavioral exploitation to maintain a monopoly. The behavioral economics literature can help explain the European Commission's abusive tying claims against Microsoft for its media player, why the Commission's original remedy failed, and the benefits and risks of the Commission's remedy involving its subsequent prosecution of Microsoft over Internet browsers.

II. TRIAL-AND-ERROR LEARNING AS AN ENTRY BARRIER

A. Importance of Entry Analysis in Monopolization Cases

The ease in entering a market has long been important in any monopolization and attempted monopolization case brought under section 2 of the Sherman Act.¹⁷ As the U.S. Supreme Court said, "without barriers to entry it would presumably be impossible to maintain supracompetitive prices for an extended time."¹⁸ The assumption is that, in markets with low entry barriers, "sellers charging supracompetitive prices will soon attract new competitors."¹⁹ Agencies and courts thus consider "market characteristics which

Maurice E. Stucke, *What is Competition?*, in *THE GOALS OF COMPETITION LAW* 27 (Academic Society for Competition Law ed., Edward Elgar Publishing 2012); Maurice E. Stucke, *Are People Self-Interested? The Implications of Behavioral Economics on Competition Policy*, in *MORE COMMON GROUND FOR INTERNATIONAL COMPETITION LAW?* 3 (Academic Society for Competition Law ed., Edward Elgar Publishing 2011); Maurice E. Stucke, *Reconsidering Antitrust's Goals*, 53 B. C. L. REV. 551 (2012); Maurice E. Stucke, *Reconsidering Competition*, *supra* note 12; Maurice E. Stucke, *Money, Is That What I Want? Competition Policy & the Role of Behavioral Economics*, 50 SANTA CLARA L. REV. 893 (2010); Maurice E. Stucke, *Antitrust 2025*, 2 COMPETITION POL'Y INT'L ANTITRUST J. (2010), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1727251; Maurice E. Stucke, *New Antitrust Realism*, GLOBAL COMPETITION POL'Y MAG., Jan. 2009, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1323815.

¹⁷ *Cargill, Inc. v. Monfort of Colorado, Inc.*, 479 U.S. 104, 119 (1986); *United States v. Am. Tobacco Co.*, 221 U.S. 106, 183 (1911) ("By the gradual absorption of control over all the elements essential to the successful manufacture of tobacco products and placing such control in the hands of seemingly independent corporations serving as perpetual barriers to the entry of others into the tobacco trade.").

¹⁸ *Cargill*, 479 U.S. at 119 (quoting *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 591 n.15 (1986)).

¹⁹ See *Bailey v. Allgas, Inc.*, 284 F.3d 1237, 1256 (11th Cir. 2002); *United States v. Microsoft Corp.*, 253 F.3d 34, 81, 82 (D.C. Cir. 2001) ("firm cannot possess monopoly power in a market unless that market is also protected by significant barriers to entry"); *AD/SAT v. AP*, 181 F.3d 216, 229 (2d Cir. 1999) (affirming summary judgment for defendant on attempted monopolization claim and noting that the presence of "low barriers to market entry" suggested that the defendant would "face significant competition from new entrants"); *Oahu*

make it difficult or time-consuming for new firms to enter a market.”²⁰ For any monopolization or attempted monopolization claim, the plaintiff must prove that the relevant market’s entry barriers are “significant” and “substantial” enough to confer monopoly power.

Since entry analysis is critical in section 2 claims, it follows that the types of entry barriers that courts recognize are also critical. One court stated, “[a]nything that tends to inhibit firms from readily and easily entering the marketplace can be analyzed as an entry barrier.”²¹ Other courts define entry barriers more narrowly.²² Today, some well-accepted entry barriers include: (1) manufacturing, distribution, and regulatory barriers, such as “planning, design, and management; permitting, licensing, or other approvals; construction, debugging, and operation of production facilities; and promotion (including necessary introductory discounts), marketing, distribution, and satisfaction of customer testing and qualification requirements;”²³ (2) the entrant’s time, expense, and likelihood to gain consumers’ confidence and trust²⁴ (especially for products with powerful chemicals that may pose significant health risks, like hair relaxers);²⁵ and (3) the time,

Gas Serv., Inc. v. Pac. Res., Inc., 838 F.2d 360, 366 (9th Cir. 1988) (“A firm with a high market share may be able to exert market power in the short run, but substantial market power can persist only if there are significant and continuing barriers to entry”) (quotations omitted); Ball Mem’l Hosp., Inc. v. Mut. Hosp. Ins., Inc., 784 F.2d 1325, 1335 (7th Cir. 1986) (noting how “the lower the barriers to entry, and the shorter the lags of new entry, the less power existing firms have”).

²⁰ Colorado Interstate Gas Co. v. Natural Gas Pipeline Co. of Am., 885 F.2d 683, 697 (10th Cir. 1989); Communication from the Commission — Guidance on the Commission’s Enforcement Priorities in Applying Article 82 of the EC Treaty to Abusive Exclusionary Conduct by Dominant Undertakings, 2009 O.J. (C 45) (in assessing dominance, take into account the competitive structure of the market, in particular “constraints imposed by the credible threat of future expansion by actual competitors or entry by potential competitors (expansion and entry”).

²¹ *In re* IBM Peripheral EDP Devices Antitrust Litig., 481 F. Supp. 965, 976 (N.D. Cal. 1979), *aff’d sub nom.* Transamerica Computer Co., Inc. v. Int’l Bus. Machines Corp., 698 F.2d 1377 (9th Cir. 1983).

²² Los Angeles Land Co. v. Brunswick Corp., 6 F.3d 1422, 1427-28 (9th Cir. 1993) (rejecting the argument that one firm’s anticompetitive conduct against another constitutes an entry barrier, since it falls outside the treatise’s definition of entry barriers as “either ‘additional long-run costs that were not incurred by incumbent firms but must be incurred by new entrants,’ or ‘factors in the market that deter entry while permitting incumbent firms to earn monopoly returns’” (quoting PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* 509-10 ¶ 409 (1992 Supp.))).

²³ U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N, HORIZONTAL MERGER GUIDELINES § 9 (Aug. 19, 2010), <http://www.justice.gov/atr/public/guidelines/hmg-2010.html>.

²⁴ United States v. H&R Block, Inc., Civ. Act. No. 11-00948 (BAH), 2011 WL 5438955, at *31-32 (D.D.C. Nov. 10, 2011).

²⁵ U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N, COMMENTARY ON THE HORIZONTAL MERGER GUIDELINES, at 39 (Mar. 2006).

likelihood, and expense needed to develop strong brand awareness from word-of-mouth customer referrals from a large customer base.²⁶

Antitrust analysis in recent years has gone beyond narrowly defined markets to vertical and horizontal competition among larger units, systems, platforms, and alliances in which potential competition plays an important analytical role. In these markets, another important entry barrier is network effects.²⁷ Network effects can be direct or indirect.²⁸ Direct network effects arise when a consumer's utility from a product (such as a telephone)

²⁶ Compl. at ¶ 51, *United States v. H&R Block, Inc.*, Civ. Act. No. 1:11-cv-00948 (D.D.C. May 23, 2011); *In re Serv. Corp. Int'l & Keystone N. Am. Inc.*, C-4284, 2010 WL 1249873 (Fed. Trade Comm'n Mar. 24, 2010) (funeral services). One court said, "reputation alone does not constitute a sufficient entry barrier in this Circuit." *Am. Prof'l Testing Serv., Inc. v. Harcourt Brace Jovanovich Legal & Prof'l Publ'ns, Inc.*, 108 F.3d 1147, 1154 (9th Cir. 1997) (citing *United States v. Syufy Enters.*, 903 F.2d 659, 669 (9th Cir. 1990) ("We fail to see how the existence of good will achieved through effective service is an impediment to, rather than the natural result of, competition.") (citations omitted)). The statement is inconsistent with reality. Companies recognize reputation as an entry barrier. See, e.g., *In re Polypore Int'l, Inc.*, 2010 WL 866178 (F.T.C. Mar. 1, 2010) (company identifying as either "very high entry barriers" or "somewhat high entry barriers": (1) "scale-based benefits"; (2) "experience, learning effects"; (3) "capital requirements"; and (4) "value of reputation, brand"); Robert Smiley, *Empirical Evidence on Strategic Entry Deterrence*, 6 INT'L J. INDUS. ORG. 167, 170-72 (1988) (many surveyed executives identified advertising and promoting the product intensively for the purpose of creating sufficient product loyalty so that potential rivals would find entry less attractive). The statement is also inconsistent with the case law, including the Ninth Circuit's. See, e.g., *Fed. Trade Comm'n v. Procter & Gamble Co.*, 386 U.S. 568, 579 (1967) (finding that the "major competitive weapon in the successful marketing of bleach is advertising" and "a new entrant would be much more reluctant to face the giant Procter [& Gamble] than it would have been to face the smaller Clorox"); *Los Angeles Land Co. v. Brunswick Corp.*, 6 F.3d 1422, 1428 (9th Cir. 1993) (recognizing "main sources of entry barriers" as "(1) legal license; (2) control over an essential or superior resource; (3) entrenched buyer preferences for established brands or company reputations; and (4) capital market evaluations imposing higher capital costs on new entrants"); *U.S. Philips Corp. v. Windmere Corp.*, 861 F.2d 695, 703 (Fed. Cir. 1988) (recognizing substantial, if not high entry barriers to the rotary electric shaver market given "the need to have a well-known brand with wide consumer acceptance, the limited number of brands that satisfy this requirement, and the substantial advertising expenditures required to attain a foothold in the market").

²⁷ *Realcomp II, Ltd. v. Fed. Trade Comm'n*, 635 F.3d 815, 829 (6th Cir. 2011) (affirming the finding of Realcomp's substantial market power from MLS's market share, network effects, and barriers to entry); *Microsoft*, 253 F.3d at 83 (requiring antitrust plaintiff to prove that (1) "network effects were a necessary or even probable, rather than merely possible, consequence of high market share in the browser market and (2) that a barrier to entry resulting from network effects would be 'significant' enough to confer monopoly power"); *In re Ebay Seller Antitrust Litig.*, C 07-01882 JF (RS), 2010 WL 760433, at *10 (N.D. Cal. Mar. 4, 2010) (defendant eBay not contesting significant barriers to entry to the online auctions market because of network effects), *aff'd* 10-15642, 2011 WL 1749206 (9th Cir. May 9, 2011); *Skydive Ariz., Inc. v. Quattrocchi*, 2009 WL 2515616, at *2 (D. Ariz. Aug. 13, 2009) (finding under *Daubert* that general economic principles on networks and network effects was reliable foundation); *Bristol Tech., Inc. v. Microsoft Corp.*, 42 F. Supp. 2d 153, 169 (D. Conn. 1998); *United States v. Microsoft Corp.*, 1998 WL 614485, at *4 (D.D.C. Sept. 14, 1998).

²⁸ Marina Lao, *Networks, Access, and "Essential Facilities": From Terminal Railroad to Microsoft*, 62 SMU L. REV. 557, 560-61 (2009).

increases as others use the product.²⁹ Indirect network effects arise when people increasingly use a product or technology (for example, software platforms). The more people that use the platform, “the more there will be invested in developing products compatible with that platform, which, in turn reinforces the popularity of that platform with users.”³⁰

Firms compete to dominate markets characterized by network effects. As one product or standard increases in popularity, it trends toward dominance “because the utility that a user derives from consumption of the good increases with the number of other agents consuming the good.”³¹ As another court observed, “once dominance is achieved, threats come largely from outside the dominated market, because the degree of dominance of such a market tends to become so extreme.”³²

B. Implications of Behavioral Economics on Entry Analysis

Entry analysis is important in any monopolization claim, but the analysis traditionally assumed that firms and consumers behaved rationally, with will-power.³³ So what happens to entry analysis when one relaxes the rationality assumption?

First, entry may or may not occur as neoclassical economic theory predicts.³⁴ Second, behavioral economics can help explain why recoupment and entry barriers play an important role in the courts’ analysis of predatory pricing claims.³⁵

²⁹ *Microsoft*, 253 F.3d at 49.

³⁰ Case T-201/04, *Microsoft Corp. v. Comm’n*, 2007 E.C.R. II-3601 (Ct. First Instance), ¶ 1061 [hereinafter *CFI Microsoft*].

³¹ *Microsoft*, 253 F.3d at 49.

³² *Novell, Inc. v. Microsoft Corp.*, 505 F.3d 302, 308 (4th Cir. 2007).

³³ *Reeves & Stucke*, *supra* note 14, at 1549-53, 1556.

³⁴ *Id.* at 1554-60 (identifying lack of entry when neoclassical theory predicts otherwise); *Stucke, Reconsidering Antitrust’s Goals*, *supra* note 16, at 563-72; Avishalom Tor, *The Fable of Entry: Bounded Rationality, Market Discipline, and Legal Policy*, 101 MICH. L. REV. 482, 505-08 (2002) (discussing the principle of overconfidence in the context of entry decision making).

³⁵ A firm may intend to monopolize a market by undertaking costly and prolonged predatory pricing. *Weyerhaeuser Co. v. Ross-Simmons Hardwood Lumber Co., Inc.*, 549 U.S. 312, 319 (2007) (“For that investment to be rational, a firm must reasonably expect to recoup in the long run at least its original investment with supracompetitive profits.”). If firms were rational profit maximizers, they would not price below average variable cost and incur losses unless their predatory-pricing scheme would likely succeed; that is, they would recover “the losses suffered plus the profits that would have been realized absent the scheme.” *Id.* Otherwise, the Court observed, “[w]ithout such a reasonable expectation, a rational firm would not willingly suffer definite, short-run losses.” *Id.* So if courts presume firms are rational, the plaintiff should prevail by showing the defendant priced below average variable cost with the intent to monopolize the market. Nonetheless, despite the firm’s below-cost pricing, courts can conclude that the aspiring monopolist was overconfident: if the firm sought subsequently to recoup (charging supracompetitive prices) its investment in predation, rational profit-maximizers would enter to rescue the consumer. Vollrath

Third, behavioral economics can explain networks effects through herding. Herding among investors can lead to irrational exuberance or pessimism over stocks, real estate, and tulips.³⁶ Fads emerge where a consumer's utility from an item (such as a designer bag) depends on who else owns the item (for example, perceived trend-setters³⁷ or masses³⁸). Consumers, at times, are confronted with competing, incompatible technologies. In choosing, consumers prefer the technology platform that others will likely choose—the more popular platform (for example, VHS versus Betamax, Blu-ray versus HD DVD, Google's Android versus Apple³⁹)—will attract more supporting complements developed for that platform.⁴⁰ Each consumer may prefer the superior technology, but forego it for the perceived popular one.⁴¹ In believing that others will opt for the subpar technology, consumers can choose the subpar technology and contribute to the suboptimal outcome. A firm may seek to secure (or maintain) its monopoly through herding, using deceptive statements⁴² and vaporware.⁴³

A fourth implication if firms and consumers have biases and heuristics is learning as an entry barrier; namely, companies to effectively compete need a minimum level of trial-and-error feedback. Firms can have imperfect knowledge about current and future consumer preferences, a blurred and

Co. v. Sammi Corp., CV 85-820 MRP, 1989 WL 201632 (C.D. Cal. Dec. 20, 1989) (“In focusing on recoupment, courts consider primarily evidence of market structure and the possibility of maintaining monopoly prices for a comfortable period without inviting in new entrants whose costs are as low as or lower than those of the monopolist.”), *aff'd*, 9 F.3d 1455 (9th Cir. 1993).

³⁶ JOHN KENNETH GALBRAITH, *A SHORT HISTORY OF FINANCIAL EUPHORIA* (Penguin Press 1993); Naomi E. Boyd, Bahattin Buyuksahin, Jeffrey H. Harris & Michael S. Haigh, *The Prevalence, Sources, and Effects of Herding* (Sept. 13, 2010), available at <http://ssrn.com/abstract=1359251> or <http://dx.doi.org/10.2139/ssrn.1359251>.

³⁷ See, e.g., THORSTEIN VEBLÉN, *THE THEORY OF THE LEISURE CLASS* 25, 33 (1899) (discussing primary motive to accumulate wealth is pecuniary emulation).

³⁸ Peter Sheridan Dodds & Duncan J. Watts, *Influentials, Networks, and Public Opinion Formation*, 34 J. CONSUMER RES. 441-58 (2007).

³⁹ Dylan Byers, *Google and Apple Battle for Developers' Hearts and Minds, at Google I/O Conference, Fight Between Android, iPhone Rages on*, ADWEEK (May 12, 2011), <http://www.adweek.com/news/technology/google-and-apple-battle-developers-hearts-and-minds-131550>.

⁴⁰ See *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 20 (D.D.C. 1999), *aff'd* in part, *rev'd* in part, 253 F.3d 34 (D.C. Cir. 2001).

⁴¹ JOHN CASSIDY, *HOW MARKETS FAIL: THE LOGIC OF ECONOMIC CALAMITIES* 130-31 (Picador 2009).

⁴² Compl. ¶ 10, *In re Intel Corp.*, FTC Docketable No. 9288 (Dec. 16, 2009), available at <http://www.ftc.gov/os/adpro/d9341/index.shtml> [hereinafter *FTC Intel Compl.*] (alleging how Intel engaged in deceptive acts and practices to mislead consumers and the public, including pressuring independent software vendors to label their products as compatible with Intel and not to similarly label with competitor's products' names or logos, even though these competitor microprocessor products were compatible).

⁴³ Stucke, *Dominant Firm's Deception*, *supra* note 15, at 1097-1102.

changing understanding of their goals and preferences, and a limited repertoire of actions to cope with whatever problems they face.⁴⁴ Consumers have changing and, at times, inconsistent preferences.⁴⁵

In this evolutionary trial-and-error process, firms “try out different problem solutions and can learn from the feedback of the market, which of their specific products and technological solutions are the superior ones.”⁴⁶ Firms and consumers make mistakes, readjust, and undertake new strategies. The competitive process “is inherently a process of trial and error with no stable end-state considered by the participants in the process.”⁴⁷

Firms compete by continually learning about customer preferences and competitors’ experimentation and by experimenting themselves with new technologies, routines, and ways of organizing. This requires a minimum amount of trial-and-error feedback.⁴⁸

Semiconductor chip manufacturers, as economist F.M. Scherer discusses, make mistakes during the early production stages. They adjust their processes and thereby lower their manufacturing costs for their next batch.⁴⁹

⁴⁴ MAX H. BAZERMAN & DON A. MOORE, *JUDGMENT IN MANAGERIAL DECISION MAKING* (7th ed., Wiley 2008); Giovanni Dosi & Luigi Marengo, *On the Evolutionary and Behavioral Theories of Organizations: A Tentative Roadmap*, 18 *ORG. SCI.* 491, 492, 494 (2007).

⁴⁵ See, e.g., Richard Layard, *Happiness & Public Policy: A Challenge to the Profession*, 116 *ECON. J.* C24, C24 (2006) (noting from happiness economic literature how “tastes are not given—the happiness we get from what we have is largely culturally determined”); Steven C. Michael & Tracy Pun Palandjian, *Organizational Learning and New Product Introductions*, 21 *J. PROD. INNOVATION MGMT.* 268, 270 (2004) (discussing shampoo industry dynamism where consumers with changing tastes seek variety).

⁴⁶ Wolfgang Kerber, *Competition, Innovation and Maintaining Diversity Through Competition Law*, in *ECONOMIC APPROACHES TO COMPETITION LAW: FOUNDATIONS AND LIMITATIONS* (Josef Drexler et al. eds., 2010), available at <http://ssrn.com/abstract=1543725>.

⁴⁷ François Moreau, *The Role of the State in Evolutionary Economics*, 28 *CAMBRIDGE J. ECON.* 847, 851 (2004).

⁴⁸ See, e.g., *In re Polypore Int’l, Inc.*, 2010 WL 866178 (Fed. Trade Comm’n Mar. 1, 2010) (noting Microporous’s intangible assets included “a favorable reputation with customers and the benefit of learning by doing, which is accumulated through having produced the product for a number of years”); *United States v. Black & Decker Mfg. Co.*, 430 F. Supp. 729, 760 (D. Md. 1976) (“Design of gas saws requires extensive empirical research which cannot be bypassed through reference to engineering texts and the like. This process of trial and error, even with competent personnel, is a gradual one of refinement.”); *Compl., United States v. Amcor Ltd.*, No. 1:10-cv-00973, 2010 WL 2724165 (D.D.C. filed June 10, 2010) (alleging “technical know-how necessary to design and successfully manufacture packaging that is able to pass customers’ qualification tests is difficult to obtain and is learned through a time-consuming trial-and-error process”).

⁴⁹ Frederic M. Scherer, *Abuse of Dominance by High Technology Enterprises: A Comparison of U.S. and E.C. Approaches*, 38 *J. INDUS. & BUS. ECON.* 39, 49-50 (2011); INTEL CORP., *ANNUAL REPORT FOR THE FISCAL YEAR ENDED DECEMBER 26, 2009* (SEC FORM 10-K), at 9 (filed Feb. 22, 2010), available at <http://www.intc.com/annuals.cfm> (“As unit volumes of a product grow, production experience is accumulated and costs typically decrease, further competition develops, and prices decline.”).

Consequently, aside from the direct and indirect network effects,⁵⁰ Intel's scale enables it secure a cost advantage where others cannot.

At least in the early stages of production, one learns "by doing," how to avoid defective chips and increase volume as additional chips are produced. Typically, each doubling and redoubling of cumulative chip volume reduces unit batch costs by 20 to 30 percent. Learning curves tend to be linear on doubly logarithmic coordinates, and their "slope" is stated to be 100 minus the percentage by which costs are reduced with each doubling of cumulative output. This leads, among other things, to a phenomenon often ignored in the economics literature: because each batch causes learning that reduces future batch costs, marginal costs (accounting for both current costs and the impact on future costs) are far below current batch costs—more so when the future cost impact is not discounted to present value, as compared to when the impact of learning on future costs is discounted.⁵¹

Smaller competitors sell only the initial batches. Intel, on the other hand, uses this internal trial-and-error feedback loop to increase its productive efficiencies over successive batches of microprocessors.

Firms can also learn through external networks with suppliers and customers.⁵² Here scale is critical when consumer preferences are unstable or unpredictable. To keep abreast with changing customer preferences, firms also rely on trial-and-error feedback loops. Firms experiment with options, monitor customer reaction to their (and competitors') offerings, and re-adjust. The more feedback firms receive from more consumers, the more the firms can refine their products and services, the better they can match their technology to customers' preferences, the greater their competitive advantage. Thus, to effectively compete, firms may need a minimum level of customer feedback, so that they can more accurately predict customer desires.

This behavioral entry barrier will increase in significance going forward. Many online vendors, such as Amazon, can offer consumers thousands of options. But with too many options, consumers are overwhelmed. They avoid choosing (or regret their choice).⁵³ Thus, an important facet of competition is pairing specific products that likely match the consumer's

⁵⁰ *FTC Intel Compl.*, *supra* note 42, ¶ 10 (discussing the need simultaneously to secure a large number of users to make the product attractive to software developers and to secure the efforts of software developers to make the product attractive to users, and Intel's success "in obtaining commitments from many computer manufacturers and software vendors to build computers and write software for Intel's new 64-bit Merced microprocessor, even though the product will not be available for nearly two years").

⁵¹ Scherer, *supra* note 49, at 49-50.

⁵² Eric von Hippel, *People Don't Need a Profit Motive to Innovate*, HARV. BUS. REV., Nov. 2011, at 37 (discussing user innovation); Ikujiro Nonaka & Hirotaka Takeuchi, *The Big Idea: The Wise Leader*, HARV. BUS. REV., May 2011, at 64.

⁵³ Simona Botti & Sheena S. Iyengar, *The Dark Side of Choice: When Choice Impairs Social Welfare*, 25 J. PUB. POL'Y & MARKETING 24, 26 (2006) (discussing information overload,

preferences. For example, suppose one seeks to purchase Philip Glass's soundtrack *Koyaanisqatsi* on Amazon.com. At the bottom of screen page is *Customers Who Bought This Item Also Bought*, which directs one to other possible recordings of interest.

Companies, like Amazon, are mining their traffic data to better predict books, movies, and music of consumers liking.⁵⁴ Companies with more subscribers (like Apple's iTunes) and more data on consumer interests (such as Google, which can mine data across its products) have more opportunities to predict what movies, books, or music the subscribers would enjoy, monitor actual selections, and revise their predictions, thereby adapting to evolving consumer preferences and products. With this scale from behavioral learning, the company can enjoy a significant competitive advantage and decrease the likelihood that an entrant can threaten its market power.

C. Trial-and-Error Learning as an Entry Barrier in the Search Engine Market

A hot antitrust issue today is the search engine market, and "whether barriers to entry exist that might prevent new competitors" into the market.⁵⁵ To help consumers navigate the Internet, Google's and Microsoft's search engines use algorithms to identify web pages that match the consumers' search terms. In this two-sided market, the better the search engine is at providing accessible and relevant information, the more popular the search engine is for consumers, the more attractive the search engine is to advertisers seeking to target those consumers, and the greater the advertising revenue the search engine garners compared to competitors.⁵⁶

where an increase in options raises the cognitive costs in comparing and evaluating the options and leads to suboptimal decision strategies).

⁵⁴ Amazon.com, Letter to Shareholders, in 2010 ANNUAL REPORT (Apr. 27, 2011), available at <http://phx.corporate-ir.net/phoenix.zhtml?c=97664&p=irol-reportsAnnual> ("For example, our search engine employs data mining and machine learning algorithms that run in the background to build topic models, and we apply information extraction algorithms to identify attributes and extract entities from unstructured descriptions, allowing customers to narrow their searches and quickly find the desired product. We consider a large number of factors in search relevance to predict the probability of a customer's interest and optimize the ranking of results.").

⁵⁵ *The Power of Google: Serving Consumers or Threatening Competition?: Hearing before the Subcomm. on Antitrust, Competition Policy and Consumer Rights U.S. Senate Judiciary Committee*, 112th Cong. (Sept. 21, 2011), available at http://judiciary.senate.gov/hearings/testimony.cfm?id=3d9031b47812de2592c3baeba64d93cb&wit_id=3d9031b47812de2592c3baeba64d93cb-0-1 [hereinafter *Senate Google Hearings*] (Statement of Patrick Leahy, U.S. Senator, U.S. Senate); see also Spencer Weber Waller, *Antitrust and Social Networking*, N.C. L. REV. (forthcoming 2012), available at <http://ssrn.com/abstract=1948690>.

⁵⁶ See Competitive Impact Statement, *United States v. Google*, (D.D.C. filed Apr. 8, 2011); *Author's Guild v. Google Inc.*, 770 F. Supp. 2d 666, 683 (S.D.N.Y. 2011) (recognizing "Google's market power in the online search market").

Google's CEO testified before a Senate antitrust subcommittee that "competition is only one click away."⁵⁷ Entry barriers, he testified, were non-existent: "Using Google is a choice (and a free one), and there are no barriers to consumers navigating to www.kayak.com, www.nextag.com, www.bing.com, www.yelp.com, www.expedia.com, or any other website."⁵⁸ If entry barriers are indeed low or non-existent, then Google cannot monopolize the search engine market, and thus cannot violate section 2 of the Sherman Act.

Under neoclassical economic theory, an antitrust plaintiff would have a hard time proving that (1) network effects were probable and (2) if even if the effects were probable, the resulting entry barriers were sufficiently high to confer monopoly power in the search engine market. Given the ease to run the search terms on different search engines, one would expect a competitive equilibrium among search engines, whereby consumers obtain roughly similar results for the same search terms. If one search engine provides less relevant or complete listings, it can hire a competitor's engineers to develop better algorithms. Absent another point of differentiation (such as better graphics or quicker results) or a tipping point,⁵⁹ one search engine should not dominate the market.

But two behavioral forces are at play here. The first is, as the next part discusses, the power of default options. It is relatively easy to run the same search on multiple search engine websites, like Bing and Google, but if consumers lack time or inclination to use multiple search engines,⁶⁰ then entry becomes more difficult. Google paid, and continues to pay, substantial amounts to be the default search engine.⁶¹

The second behavioral force is the importance of scale in trial-and-error experimentation. In some industries, as a company secures more data on human behavior, a new form of network effects emerges. A search engine cannot read the consumer's mind.⁶² Google does not know when the consumer types "apple" and "orange," whether she is searching for fruit or technology companies. When a consumer types "orange," and "apple,"

⁵⁷ *Senate Google Hearings*, *supra* note 55 (Testimony of Eric Schmidt, Executive Officer, Google Inc.).

⁵⁸ *Id.* at 7.

⁵⁹ See, e.g., Jean Gabszewicz, Paolo Giorgio Garella & Nathalie Sonnac, *Newspapers' Market Shares and the Theory of the Circulation Spiral*, 19 INFO. ECON. & POL'Y 405-13 (2007) (examining death spiral theory of daily newspaper in two-newspaper towns whereby circulation decline causes advertisers to support the other competitor).

⁶⁰ Steve Lohr, *Can These Guys Make You 'Bing'?*, N.Y. TIMES, July 31, 2011, at 5 (saying greatest hurdle for Bing, according to Microsoft executive, is consumer habits, which favors Google).

⁶¹ Steve Lohr, *The Default Choice, So Hard to Resist*, N.Y. TIMES, Oct. 16, 2011, at 5.

⁶² *Eye-Tracking Google SERPs: 5 Tales of Pizza*, THE DAILY SEO BLOG (Oct. 5th, 2011), <http://www.seomoz.org/blog/eyetracking-google-serps> (discussing custom eye-tracking data for Google searches).

Google quickly generates an “opinion as to what information users will find most useful.”⁶³ Google has the benefit of observing which, if any, links its users actually choose. If many choose a link that was originally offered down the list (say on the third or fourth page of results), Google’s algorithms can harvest that information to move that link up the list; Google demotes less frequently tapped suggested links down the list.⁶⁴ Thus the more consumers use the search engine and the more searches they run, the more trials the search engine company has in predicting consumer preferences, the more feedback the search engine receives of any errors, and the quicker the search engine can respond with recalibrating its offerings.⁶⁵ Increased traffic volumes makes more experiments possible, thereby improving search results.⁶⁶ With more trial and error, the search engine can adapt to changing preferences, improve its product, and thereby attract additional consumers to that search engine compared to competitor sites.⁶⁷ Google’s popularity enables more trial-and-error experimentation, which in turn increases its popularity. Google with its massive number of search users can “tap into the ‘wisdom of the users’” to identify the most relevant websites for any given query.⁶⁸ It can innovate with predictive search technology (such as suggesting search phrases that refine the consumer’s search) and quickly provide information that obviates the need for further searching.

A new entrant can hire Google’s tech talent, but it still lacks the scale of this trial-and-error experimentation. With fewer trials, entrants have fewer opportunities to predict search terms (or what the consumer wants to know). Entrants have fewer opportunities to observe subsequent errors and to perceive trends (consumers’ search terms relating to a hot topic). Their ability to

⁶³ As Google’s CEO testified,

When a consumer enters search terms, those terms are processed by the search engine’s mathematical algorithms, which determine the probability that any given webpage will be responsive to the search. The user then receives results that are rank-ordered based on the search engine’s judgment of the likelihood that each result matches what the user was seeking in entering the search terms. This process necessarily depends on multiple variables and constant refinement.

Senate Google Hearings, *supra* note 55, at 2 (Testimony of Eric Schmidt, Executive Officer, Google Inc.).

⁶⁴ Lohr, *Bing*, *supra* note 60, at 1.

⁶⁵ *Id.* at 3 (“Consumer testing is key to the algorithm refining process, and Google uses both human reviewers and samples of real search traffic in order to measure whether a proposed algorithm change improves the user experience or not.”).

⁶⁶ Teresa Vecchi, Jerome Vidal & Viveca Fallenius, *The Microsoft/Yahoo! Search Business Case*, 2 EUR. COMM’N COMPETITION POL’Y NEWSL. at 46 (2010).

⁶⁷ *Id.* at 46 (EC finding that the “quality and relevance of the algorithmic search engine” as “the most important factor in attracting users to a particular search engine”).

⁶⁸ *Senate Google Hearings*, *supra* note 55, at 2 (Testimony of Eric Schmidt, Executive Officer, Google Inc.).

identify sites that consumers prefer likely will remain inferior, so the entrant remains at a competitive disadvantage in attracting consumers and advertisers.

Recognizing this, a smaller search engine can specialize in specific functions.⁶⁹ For example, consumers today bypass the general search engine to find travel and flight options on travel-specific Internet sites, such as Kayak, Expedia, and Travelocity. Consumers can search for books directly on Amazon's website. They can review restaurants on Zagat, which Google acquired.⁷⁰ Smaller search engines complement, rather than replace, Google.

One downside in becoming a niche player is that the search engine can lose an important segment of the population. As Microsoft observed,

there's this kind of inverse power loss, where 39 percent of the users account for 66 percent of all the searches. I think of them as the heavy searchers. Ourselves and Yahoo! and others have been losing heavy searchers for the last number of years. Since the Bing launch, we've actually inverted that, we're actually growing heavy searchers. And when you look at the demographics, we are over-indexed on 18 to 24 year olds now as a result of those heavy users. Before that, we were over-indexed on 65-year plus in terms of demographics, which is our MSN base.⁷¹

So if your audience is primarily over 65 years old, your searches may start skewing to their preferences, which may differ from younger audiences.

While the entry barriers are higher than Google's CEO asserts, the general search market is not impenetrable. "In 1998, the year Google was incorporated," observed its CEO, "Yahoo!, which had hundreds of millions of users, was declared the winner of the 'search engine wars'—it got twice as many visitors as its nearest competitor and had 'eviscerated the competition.'"⁷² Thus, Google was able to penetrate and displace Yahoo. Today Microsoft believes it can succeed with its search engine Bing. Its battle against Google, according to industry executives and analysts, is costing Microsoft billions of dollars.⁷³ But Microsoft did not enter *de novo*. Instead, it justified its Yahoo partnership as necessary to achieve this scale of behavioral trial-and-error learning.⁷⁴ Before the partnership, fewer people used

⁶⁹ Daniel A. Crane, *Search Neutrality and Referral Dominance*, 8 J. COMPETITION L. & ECON. (2012).

⁷⁰ Brian Womack, *Google Discloses \$151 Million Price Tag for Acquisition of Zagat Service*, BLOOMBERG, Oct. 26, 2011, <http://www.bloomberg.com/news/2011-10-27/google-spent-151-million-on-zagat-review-service-last-quarter.html>.

⁷¹ Yusuf Mehdi, Senior Vice President, Online Audience Business, Remarks at the Credit Suisse Annual Technology Conference (Dec. 1, 2009).

⁷² *Senate Google Hearings*, *supra* note 55, at 2 (Testimony of Eric Schmidt, Executive Officer, Google Inc.).

⁷³ Lohr, *Bing*, *supra* note 60, at 1.

⁷⁴ In December 2009, Microsoft partnered with Yahoo! to provide the exclusive algorithmic and paid search platform for the Yahoo! web sites. Microsoft believed this agreement would allow it over time to improve the effectiveness and increase the value of its "search offering through greater scale in search queries and an expanded and more competitive search and

Microsoft's and Yahoo's search engines compared to Google.⁷⁵ As Microsoft's CEO Steve Ballmer said,

it turns out there's a feedback loop in the search business, where the most searches you serve, or paid ad searches you serve, the more you learn about what people click on, what's relevant, and it turns out that scale drives knowledge which then can turn around and redrive innovation and relevance. So, actually even our ability to understand our customers and innovate around that is enhanced by putting the two assets together. It's not just putting them together, but putting them together in this business, which is unlike other businesses, there is a return to scale from seeing that much more Internet activity than either Yahoo! or Microsoft sees independently.⁷⁶

Microsoft positions Bing as a decision-engine (providing consumers with information to help with decisions, such as good restaurants nearby). Bing's consumer usage has increased, but not at Google's expense.⁷⁷ To gain an additional advantage, Microsoft entered into a search arrangement with the social network site, Facebook.⁷⁸ Its relationship with the largest social network site, Google's CEO testified, may provide Microsoft "a tremendous advantage" if "Facebook and Bing can harness the power of search algorithms and a customer's social graph to answer a query."⁷⁹ It remains unclear whether Microsoft's Bing will attain the necessary scale to threaten Google's monopoly.⁸⁰

Consequently, Google's dominance of the search market is not guaranteed. But, besides conventional network effects, courts going forward should consider trial-and-error learning barriers in industries where consumer preferences are unstable and hard to predict.

advertising marketplace." MICROSOFT CORP., ANNUAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2011 (SEC FORM 10-K), at 6 (filed July 28, 2011), available at <http://apps.shareholder.com/sec/viewerContent.aspx?companyid=MSFT&docid=8062497>.

⁷⁵ The European Commission, for example, found that Google's share of the search and advertising markets in the European Economic Area was over 90 percent. Vecchi, *supra* note 66, at 46.

⁷⁶ Transcript from Remarks from the Conference Call Held by Steve Ballmer, Chief Executive Officer, Microsoft, and Carol Bartz, Chief Executive Officer, Yahoo!, to Announce the Search Engine Agreement Between Yahoo! and Microsoft, MICROSOFT NEWS CENTER (July 29, 2009), <http://www.microsoft.com/presspass/exec/steve/2009/07-29search.msp>.

⁷⁷ Lohr, *Bing*, *supra* note 60, at 1, 5.

⁷⁸ Dina Bass, *Microsoft Bing Adds Facebook Data*, BLOOMBERG, May 16, 2011, <http://www.bloomberg.com/news/2011-05-16/microsoft-s-bing-searches-add-facebook-data-to-show-what-friends-like-.html>.

⁷⁹ *Senate Google Hearings*, *supra* note 55, at 4 (Testimony of Eric Schmidt, Executive Officer, Google Inc.).

⁸⁰ Matt Rosoff, *Microsoft Should Have Let Google Have Search to Itself*, BUS. INSIDER, Apr. 20, 2011, <http://www.businessinsider.com/microsoft-should-have-let-google-have-search-to-itself-2011-4#ixzz1Lyx0ikow>.

III. BEHAVIORAL EXPLOITATION

As Part II discusses, firms, through trial-and-error learning, can better predict and accommodate consumers' changing preferences. Consumers benefit, but entry barriers can increase as well. As this part discusses, monopolists can devise better ways to exploit consumers' biases and heuristics (such as status quo bias, framing effects, and sunk cost fallacy) to maintain their monopoly. Through the lens of neoclassical economic theory, such behavior, rather than exploitive, appears benign. Rational consumers should defeat the exercise of market power by switching to lower-cost substitutes offered by fringe firms or entrants. But as this part discusses, even when information costs are low, consumers, with status quo bias and sunk cost fallacy, do not switch as neoclassical theory predicts.⁸¹

One example is when a monopolist uses default options to maintain its monopoly. The European Commission's abusive tying claim against Microsoft provides a rich narrative: Microsoft premised its defense on rational choice theory. The Commission and Court of First Instance responded with actual consumer behavior (which the behavioral economics literature explains well). The Commission's remedy failed, as behavioral economics would predict. In its subsequent prosecution of Microsoft, the Commission reconsidered its behavioral remedy, the benefits and risks of which this article examines from a behavioral economics perspective.

A. European Commission's Abusive Tying Case Against Microsoft

Microsoft had (and still has) a monopoly for personal computer operating systems.⁸² The Commission accused Microsoft, *inter alia*, of tying its media player to its operating system. Media players enable consumers to store and play music and videos on their computers (and now on handheld devices). Originally, RealNetworks licensed its media player to Microsoft.⁸³ By 1997, senior Microsoft executives were concerned about these multimedia technologies jeopardizing Microsoft's operating system monopoly.⁸⁴ In 1998, Microsoft released its *Microsoft Media Player*, which at that time supported

⁸¹ See, e.g., U.K. INDEPENDENT COMMISSION ON BANKING, INTERIM REPORT CONSULTATION ON REFORM OPTIONS 33-38 (Apr. 2011) (noting how consumers do not switch banks as often as economic theory predicts).

⁸² By the late 1990s, Microsoft accounted for more than 95 percent of the licensing of all Intel-compatible PC operating systems worldwide. *Microsoft*, 253 F.3d at 54. "Operating systems perform many functions, including allocating computer memory and controlling peripherals such as printers and keyboards," found the court, including the "function as platforms for software applications." *Id.* at 53. As of November 2011, Microsoft controlled over 90 percent of that market. Net Market Share, Desktop Operating System Market Share (May 2012), available at <http://www.netmarketshare.com/operating-system-market-share.aspx?qprid=8&qpcustommd=0>.

⁸³ *CFI Microsoft*, ¶ 837 (noting how Microsoft included RealPlayer in its Internet Explorer 4.0).

different formats, including Apple's QuickTime and RealNetworks' RealAudio and RealVideo.⁸⁵ That changed by 1999, when Microsoft released its Windows Media Player, which "no longer provided native support for RealNetworks' or QuickTime's formats."⁸⁶

The Commission raised concerns about Microsoft's incorporating its media player in its Windows operating system and the player's lack of interoperability.⁸⁷ It found Microsoft to have abused its dominant position.

A tying claim has four elements:⁸⁸ first, Microsoft is dominant in the market for the tying product (here personal computer operating systems)—Microsoft did not dispute this element.⁸⁹ Second, the tied product (the media player) and the tying product (Microsoft's operating system) are two separate products.⁹⁰ Third, Microsoft did not give consumers a choice to obtain the tying product without the tied product.⁹¹ Fourth, the tying forecloses competition.

What is interesting, for our purposes, is the offense's fourth element. The European Commission, like the district court in the U.S. antitrust case, observed how the personal computer software industry was characterized with network effects.⁹² The Commission argued, and Court of First

⁸⁴ *Microsoft*, 84 F. Supp. 2d at 30 (Microsoft "noted the dangers of Apple's and RealNetworks' multimedia playback technologies, which ran on several platforms (including the Mac OS and Windows) and similarly exposed APIs to content developers. Microsoft feared all of these technologies because they facilitated the development of user-oriented software that would be indifferent to the identity of the underlying operating system.").

⁸⁵ *CFI Microsoft*, ¶ 837.

⁸⁶ *Id.*

⁸⁷ Commission Decision of 24.03.2004 Relating to a Proceeding under Article 82 of the EC Treaty (Case COMP/C-3/37.792 – Microsoft), 2007 O.J. (L 32) 23, ¶ 5, <http://www.steptoec.com/assets/attachments/1868.pdf> [hereinafter EC Microsoft] (second Statement of Objections).

⁸⁸ *CFI Microsoft*, ¶¶ 842, 849.

⁸⁹ *Id.* ¶ 854.

⁹⁰ Microsoft argued that liability would punish dominant undertakings from improving their products by integrating new features in them. A dominant firm, argued Microsoft, would be obligated to remove its innovations whenever a third party marketed a standalone product that provided the same or similar functionalities. *Id.* at ¶ 888. The United States Court of Appeals for the D.C. Circuit was sympathetic to Microsoft's claims. The Court held that the *per se* illegality standard should not apply to Microsoft's tying its Internet web browser, Explorer, to its operating system. *Microsoft*, 253 F.3d at 95. The Court remanded for review under a more lenient rule of reason standard, and the United States and Microsoft settled.

⁹¹ In both the United States and the European Union, one evil of tying is the monopolist "affords consumers no choice but to purchase" (not so much to use) the tied product. *Microsoft*, 253 F.3d at 85. *See also* Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 461-62 (1992); Jefferson Parish Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2, 12-18 (1984); *CFI Microsoft*, ¶ 865 (noting how coercion was mainly applied first of all to OEMs, who then pass it on to the end user).

⁹² One complaint was that with its operating systems monopoly (enforced by network effects), Microsoft could ward off potential threats by tying its imitation product. Once Microsoft added its version, the Commission found, programmers developed solutions for the Microsoft platform because it would reach automatically 90 percent of client PC users, and

Instance found, that such bundling “discourages investment in all the technologies in which Microsoft could conceivably take an interest in the future.”⁹³ Microsoft’s tying of its media player to its operating system had, the Court of First Instance found, the “inevitable consequence of affecting relations on the market between Microsoft, OEMs and suppliers of third-party media players by appreciably altering the balance of competition in favor of Microsoft and to the detriment of the other operators,” such as RealNetworks. The tying created “a disincentive for users to use third-party media players and for [computer manufacturers] to pre-install such media players on client PCs.”⁹⁴ Given this disincentive, the Court was concerned that the tying would weaken competition among media players “in such a way that the maintenance of an effective competitive structure would not be ensured in the near future.”⁹⁵

B. Microsoft’s Defense Premised on Rational Choice Theory

Under neoclassical economic theory, it is difficult to see any significant foreclosure and resulting harm to competition. Microsoft’s Windows Media Player came with the Windows operating system. But no one disputed that consumers, after unpacking the computer and starting it up, could search the Internet for the media player they want, download the software to their computer, and use that media player to stream music or videos.⁹⁶ The Commission never argued that consumers were unaware of other competing media players. This was unlikely. Consumers presumably knew of RealNetworks’ media player—it was part of Microsoft’s earlier operating system.

Nor were consumers or the OEMs disadvantaged if they selected an alternative media player.⁹⁷ After the U.S. antitrust consent decree, Microsoft could not design its operating system to hamper rival media players, as it earlier did with its Internet browser.⁹⁸ Nor could Microsoft contractually

thus save the content providers the costs of supporting different technology platforms. EC Microsoft, *supra* note 87, ¶ 880. Under this positive feed-back loop, more users of a given software platform lead to a greater incentive to develop products compatible with that platform, which reinforces that platform’s popularity with end-users (and the software company’s market power). *Id.* ¶ 882. Thus Microsoft chilled the incentives for potential innovators to challenge the entrenched monopolist. *Id.* ¶ 891.

⁹³ *Microsoft*, 2007 E.C.R. II-3601.

⁹⁴ Press and Information, CJE/07/63, Press Release No. 63/07, Judgment of the Court of First Instance in Case T-201/04, *Microsoft Corp. v Comm’n of the European Cmty.* (Sept. 17, 2007).

⁹⁵ *Id.*

⁹⁶ *CFI Microsoft*, ¶ 829. Moreover, media players may be sold in retail outlets or distributed with other software products. *Id.* ¶ 830.

⁹⁷ *Id.* ¶ 995.

⁹⁸ EC Microsoft, *supra* note 87, ¶ 796 n.922.

require software developers, content providers, or anyone else to distribute or promote exclusively or mainly its Windows Media Player.⁹⁹ Microsoft's operating system could run one or more media players without affecting the media players' performance.¹⁰⁰

Nor were consumers forced to use Microsoft's player. Consumers could set another media player as the default option.¹⁰¹ As the Commission and Court of First Instance observed, a "not insignificant number of customers continue to acquire media players from Microsoft's competitors, separately from their client PC operating system, which shows that they regard the two products as separate."¹⁰² At the time of litigation, consumers used on average 1.7 media players each month, and that number was increasing.¹⁰³ Consequently, how could Microsoft foreclose competition when consumers could download (often for free) Apple's and RealNetworks' alternative media players off the Internet?¹⁰⁴

One could strain under rational choice theory to find coercion. First, consumers must expend some time and effort to download a media player.¹⁰⁵ This can take longer for users without broadband Internet service. Second, computer manufacturers and consumers could not delete Microsoft's media player.¹⁰⁶ Any media player would be in addition to Microsoft's product.¹⁰⁷ Thus, the computer memory, used by Microsoft's media player, could not be used for other purposes. Third, Microsoft devised its software so that its Player could override the consumer's default setting and reappear when the consumer used Microsoft's web browser, Internet Explorer, to access media files streamed over the Internet.¹⁰⁸

While annoying, these factors hardly justify a finding of foreclosure. If other media players offered superior performance for free (or at an attractive

⁹⁹ *CFI Microsoft*, ¶ 995 (no exclusivity provisions).

¹⁰⁰ *Id.* ¶ 993.

¹⁰¹ *Id.* ¶ 952.

¹⁰² *Id.* ¶ 932.

¹⁰³ *Id.* ¶ 953.

¹⁰⁴ The Commission questioned the extent the media players were free: "Third-party media players offering all the functionality of WMP are often not given away for free. Microsoft's argument that 'media player vendors have business models in which they give away most copies of their products' therefore has to be taken with a degree of caution. It would indeed appear that users feel still less inclined to buy a second media player—even though it offers more functionality than a basic free version of the same brand—where they have already obtained a comparable full-fledged media player pre-installed on their PC." EC *Microsoft*, *supra* note 87, ¶ 847 (footnotes omitted). Consumers today can download a free copy of RealPlayer (at <http://www.real.com/realplayer>), QuickTime (at <http://www.apple.com/quicktime/download/>), and other media players (at <http://download.cnet.com/windows/media-players/>).

¹⁰⁵ *Id.* ¶¶ 866-67. The scarcity of broadband Internet, slower download times, and failed downloads also may have contributed to consumers' sticking with the default.

¹⁰⁶ *CFI Microsoft*, ¶¶ 832, 837.

¹⁰⁷ *Id.* ¶ 946.

¹⁰⁸ *Id.* ¶ 974.

price),¹⁰⁹ then rational consumers would incur these costs to acquire a competing media player. Put simply, if the benefits of using a competing media player outweigh the costs, rational consumers would switch. Since rational consumers would switch to alternative media players of “better quality,”¹¹⁰ then software programmers and music companies would continue to support the superior players’ formats. Microsoft’s attempt to thwart the competitive threat of middleware (or leverage its monopoly to the media player market) would fail.

If most consumers (1) did not purchase Windows N (the version of Microsoft’s operating system without its Windows Media Player) and (2) did not download RealNetworks’ and Apple’s competing media players when they readily could have, then this behavior, under neoclassical economics theory, is consistent with competition on the merits. Rational consumers could and would switch to superior media players. If consumers did not switch, then Microsoft’s media player must equal (or surpass) competing media players.

Here is the problem. Windows Media Player’s growth, as Microsoft recognized, was not attributable to its superior quality over rival products.¹¹¹ “In fact, Microsoft’s own October 2003 submission illustrates that the reviews presented (1999-2003) rate the best product to be RealNetworks’ player more often than WMP [Windows Media Player].”¹¹² Consequently, fewer consumers than neoclassical economic theory predicted were switching to superior media players.

C. The Commission and Court of First Instance’s Response of Actual Consumer Behavior

For a rational choice theorist, the default option (assuming low transactions costs and no informational asymmetries) should not matter. Say consumers prefer Windows Media Player. If computer manufacturers installed another media player, then consumers would switch to Windows Media Player. So whatever the default option, consumers should readily opt for the superior media player.

But as the behavioral economics literature shows, the setting of the default can often determine the outcome (even when transaction costs are nominal).¹¹³ Default options have played an important role in participation and investments in retirement savings, contractual choices in health-clubs,

¹⁰⁹ EC Microsoft, *supra* note 87, ¶¶ 847-48.

¹¹⁰ CFI Microsoft, ¶ 971.

¹¹¹ *Id.* ¶ 1057.

¹¹² EC Microsoft, *supra* note 87, ¶ 948.

¹¹³ RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 78 (Yale Univ. Press 2008).

organ donations, car insurance plans, and participation in class actions.¹¹⁴ The U.S. district court in the Google book search action observed that many concerns over the proposed settlement would be “ameliorated” if the settlement were converted from an “opt-out” to an “opt-in” settlement.¹¹⁵ Not surprisingly, firms and consumers can have different preferences over the default option.¹¹⁶

Microsoft preferred having its inferior media player as the default choice, thereby requiring consumers to opt out. As Microsoft recognized, some consumers would reject the default media player and download a rival player. But many consumers would stick with the default media player. Consequently, the Court of First Instance recognized that consumers “who find Windows Media Player pre-installed on their client PCs are generally less inclined to use another media player.”¹¹⁷ The European Commission was blunter: “A supply-side aspect to consider is that, while downloading is in itself a technically inexpensive way of distributing media players, vendors must expend resources to overcome end-users’ inertia and persuade them to ignore the pre-installation of [Windows Media Player].”¹¹⁸ Nor is inertia the only factor at work. Some non-computer-savvy consumers may believe that the default option represents the OEM’s choice of the superior media player.¹¹⁹ Status quo bias explains why many consumers remain with the default option, even though neoclassical theory predicts that many consumers would download superior alternative media browsers.

The facts did not support Microsoft’s neoclassical economic theory. But Microsoft argued that the facts contradicted the Commission’s behavioral explanation. Downloading was a viable mechanism to distribute a media player, Microsoft argued, as “more than 100 million copies of WMP 9 were

¹¹⁴ *Id.* at 129-30; Stefano DellaVigna, *Psychology and Economics: Evidence from the Field*, 47 J. ECON. LIT. 315, 322 n.11 (2009); Eric J. Johnson, Steven Bellman & Gerald L. Lohse *Defaults, Framing and Privacy: Why Opting In-Opting Out*, 13 MARKETING LETTERS 5 (2003) (consent to receive e-mail marketing); C. Whan Park, Sung Youl Jun & Deborah J. MacInnis, *Choosing What I Want Versus Rejecting What I Do Not Want: An Application of Decision Framing to Product Option Choice Decisions*, 37 J. MARKETING RES. 187 (2000) (car option purchases); EUROPEAN CONSUMER CONSULTATIVE GROUP, OPINION ON PRIVATE DAMAGES ACTIONS 4 (2010), available at http://ec.europa.eu/consumers/empowerment/docs/ECCG_opinion_on_actions_for_damages_18112010.pdf (in European countries, where consumers had to opt into the class, the rate of participation in class actions for consumer claims was less than one percent; whereas under opt-out regimes (where the default is that one is a class member unless one opts out), participation rates were typically very high (97 percent in the Netherlands and almost 100 percent in Portugal)).

¹¹⁵ *Author’s Guild v. Google Inc.*, 770 F. Supp. 2d 666, 686 (S.D.N.Y. 2011).

¹¹⁶ 74 Federal Register 59036 (Nov. 17, 2009), available at <http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20100219a1.pdf> (majority of surveyed participants preferred setting the default as opt-in (consumers having to opt into the bank’s overdraft program) rather than having to opt out (which many banks preferred)).

¹¹⁷ *CFI Microsoft*, ¶ 980.

¹¹⁸ *EC Microsoft*, *supra* note 87, ¶ 870 (quoted in *CFI Microsoft*, ¶ 1052).

¹¹⁹ *CFI Microsoft*, ¶ 1050.

downloaded in the ten months the software was available to the general public.”¹²⁰ If many consumers would remain with the default option, then logically consumers would stick not only with the default media player, but also with that version of the media player. If consumers overcame status quo bias to upgrade their default media player, then, arguably, they could upgrade to any media player.

The Commission found that these upgraded “copies were downloaded by people who already had a version of Windows Media Player installed on their PCs.”¹²¹ Tellingly Microsoft did not rely on its consumers to search for and download software updates. Instead, Microsoft nudged its consumers. Microsoft designed its personal computer software to independently and regularly look for upgrades on Microsoft’s web site, and to prompt the user to download it.¹²² Moreover, since consumers procrastinate, Microsoft “repeatedly” prompted the consumer to download its upgraded Media Player if consumers chose not to do so at the first prompt.¹²³

So the European Commission recognized the default option matters. Regulators and the industry will battle over whether consumers need to opt-out or opt-in. If Microsoft seriously considered downloading as “an equivalent alternative to pre-installation,” observed the European Commission, then Microsoft’s “insistence on maintaining its current privilege of automatic pre-installation appears inconsistent.”¹²⁴

Besides status quo bias, there is also the sunk cost fallacy. Consumers, under neoclassical economic theory, “ignore sunk costs (costs that cannot be recovered, such as the cost of nonrefundable tickets).”¹²⁵ Consumers instead consider the costs and benefits going forward. To illustrate:

Assume that you have spent \$100 on a ticket for a weekend ski trip to Michigan. Several weeks later you buy a \$50 ticket for a weekend ski trip to Wisconsin. You think you will enjoy the Wisconsin ski trip more than the Michigan ski trip. As you are putting your just-purchased Wisconsin ski trip ticket in your wallet, you notice that the Michigan ski trip and the Wisconsin ski trip are for the same weekend! It’s too late to sell either ticket, and you cannot return either one. You must use one ticket and not the other. Which ski trip will you go on?¹²⁶

The \$50 and \$100 costs are effectively sunk. Under neoclassical economic theory, consumers would consider the costs/benefits going forward and choose the more enjoyable Wisconsin ski trip. But more people, in response

¹²⁰ EC Microsoft, *supra* note 87, ¶ 864.

¹²¹ *Id.*

¹²² *Id.*

¹²³ *Id.*

¹²⁴ *Id.* ¶ 871.

¹²⁵ Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1482 (1998).

¹²⁶ Hal R. Arkes & Catherine Blumer, *The Psychology of Sunk Cost*, 35 ORG. BEHAV. & HUM. DECISION PROCESSES 124, 126 (1985).

to this question, chose the Michigan trip.¹²⁷ Accordingly, firms, governments, and consumers, under the sunk cost fallacy, “throw good time and money after bad even when the logical decision is to cut bait.”¹²⁸

Monopolists can use the sunk cost fallacy to maintain their monopoly. Consumers, for example, can invest significant costs in downloading songs and movies, creating play lists, and organizing their music and videos on their media players. These costs are effectively sunk. For rational consumers, the sunk costs invested in Windows Media Player are irrelevant. Knowing they will continue to download music and movies, consumers would consider the benefits and costs going forward with alternative media players. But consumers, under sunk cost fallacy, would not want their earlier time, expense, and effort wasted; so they continue using Windows Media Player until a disruptive innovation (like Apple’s iPod, iPhone, and iPad) comes along.¹²⁹

To lock-in consumers, monopolists, besides reducing interoperability,¹³⁰ can remind consumers of their sunk costs, even though the consumer going forward would be better off opting out. The sunk cost fallacy magnifies the switching costs, thereby increasing the “locked-in” effect and the level of price increases (or reduced quality or services) consumers will tolerate before switching to alternatives.¹³¹

¹²⁷ *Id.* at 126 (33 opted for Michigan, versus 28 for Wisconsin).

¹²⁸ Malcolm Baker, Richard S. Ruback & Jeffrey Wurgler, *Behavioral Corporate Finance: A Survey* 49 (Nat’l Bureau of Econ. Research, Working Paper No. 10863, 2004); Janky v. Batistatos, 2008 WL 4411504, at *1 (N.D. Ind. Sept. 25, 2008) (noting how “from the acorn of a relatively minor copyright dispute a mighty oak tree of litigation has resulted—two federal cases, three federal appeals, a state case, and several rounds of sanctions”).

¹²⁹ Interestingly, Apple is currently being sued for encoding its digital music files with its proprietary digital rights management software that only allow digital music files purchased from Apple’s iTunes Store to be played directly on iPods; the files could not be played directly on competitors’ digital music players. Apple allegedly prevented digital music files sold at other companies’ online music stores from being played on iPods. Plaintiffs in the private antitrust claim allege that Apple sought to foreclose RealNetworks, which in 2004, announced that its digital music files could be played on iPods. When Apple’s updates to the software were released in October 2004, plaintiffs allege that “users were forced to update their iTunes applications and iPods, the digital music files from RealNetworks’ online store were no longer interoperable with Apple’s iPods.” Apple iPod iTunes Antitrust Litigation, Slip Copy, 2011 WL 976942, at *1 (N.D.Cal. Mar. 21, 2011).

¹³⁰ Compl. ¶ 194, RealNetworks, Inc. v. Microsoft Corp., 2003 WL 23145603 (N.D.Cal. Dec. 18, 2003) (alleging that Microsoft “reduced the interoperability of RealNetworks’ products with Microsoft’s operating systems” to thwart consumers from transferring their media library to rival players). Microsoft eventually entered three agreements valued at \$761 million to RealNetworks to settle the antitrust case and create a new partnership. Press Release, Microsoft Corp., Microsoft and RealNetworks Resolve Antitrust Case and Announce Digital Music and Games Partnership (Oct. 11, 2005), available at <http://www.microsoft.com/presspass/press/2005/oct05/10-11msrealpr.msp>.

¹³¹ Eastman Kodak Co. v. Image Technical Services, Inc., 504 U.S. 451 (1992).

D. The Shortcomings of the Commission's Remedy

One issue with status quo bias is determining an appropriate remedy. The Commission, according to Microsoft, believed there would not be an abusive tie if Microsoft offered *at the same price* two versions of its operating system: one with Windows Media Player and one without.¹³² As its principal remedy, the Commission and Court allowed Microsoft “the right to continue to offer the version of Windows bundled with Windows Media Player and that it is required only to make it possible for consumers to obtain the operating system without that media player.”¹³³ Suppose you could choose between two Windows operating systems: one with and one without Windows Media Player. Both cost the same amount. Which would you choose?

The remedy was ineffectual.¹³⁴ As Microsoft accurately predicted, no one would demand the operating system without the media player.¹³⁵ One need not be a behavioral economist to predict the remedy's shortcomings, but prospect theory helps explain why the remedy failed.¹³⁶

Under neoclassical expected utility theory, people weigh the utilities of outcomes by their probabilities.¹³⁷ Prospect theory, borne out from behavioral experiments, has four important findings.

First, when it comes to sure gains, people are more risk averse.¹³⁸ More people opt for the sure gain (\$3000) rather than the higher discounted value represented by the gamble (an 80-percent likelihood of winning \$4000).¹³⁹ Second, when faced with a sure loss, people become risk seeking. More people now opt for the gamble (an 80-percent likelihood of paying \$4000) rather than paying the sure loss (\$3000).¹⁴⁰ Third, the consumer's response will vary if the option is perceived as avoiding a loss (consumers more risk seeking) or as a sure gain (consumers more risk averse).¹⁴¹ Fourth, losses

¹³² *CFI Microsoft*, ¶ 891. The EC denied making this admission in its decision. *Id.* at ¶ 908.

¹³³ EC Press Release No 63/07, Judgment of the Court of First Instance in Case T-201/04, *Microsoft Corp. v. Comm'n of the European Cmty.* (Sept. 17, 2007), available at <http://europa.eu/rapid/pressReleasesAction.do?reference=CJE/07/63&format=HTML&aged=0&language=EN&guiLanguage=en>.

¹³⁴ Kevin J. O'Brien, *As EU Debated, Microsoft Took Market Share*, N.Y. TIMES, Sept. 16, 2007, <http://www.nytimes.com/2007/09/16/business/worldbusiness/16iht-msft17.1.7522119.html> (noting that settlement perceived as a “commercial flop”); Scherer, *supra* note 49, at 45 (characterizing remedy as “an abject failure”).

¹³⁵ *CFI Microsoft*, ¶ 891 (noting also how Microsoft argued that this lack of demand supported its contention that “‘Windows with media functionality’ is a single product”).

¹³⁶ Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision under Risk*, 47 *ECONOMETRICA* 263 (1979).

¹³⁷ *Id.* at 265.

¹³⁸ *Id.* (people in the experiments “overweight outcomes that are considered certain, relative to outcomes which are merely probable”).

¹³⁹ *Id.* at 266.

¹⁴⁰ *Id.* at 268.

¹⁴¹ Daniel Kahneman, *Maps of Bounded Rationality: Psychology for Behavioral Economics*, 93 *AM. ECON. REV.* 1449, 1458 (2003) (Asian disease).

closer to a reference point hurt more than twice the joy from comparable gains.¹⁴² Suppose one could measure happiness and sadness in standard units (say utils). Prospect theory predicts that if the joy in finding \$100 were 100 utils, then pain in losing \$100 would be between 200 and 250 utils.¹⁴³

Framings effects and the reference point matter. One example is surcharges for paying with a credit card or obtaining a discount for paying with cash. The merchant bears different cost for accepting different credit cards. The merchant has two ways to characterize the reference point: first as a lower cash price with an imposed *surchage* for customers using a credit card with a higher interchange fee. Alternatively, the merchant can set the credit price as the reference point and offer consumers a *discount* if they paid with cash (or a credit or debit card with a lower interchange fee). The net price is the same. How the choice is framed should not affect the outcome. After the credit card companies' No-Discrimination Rule was abolished, Dutch merchants could impose surcharges or offer discounts based on how the customer was going to pay. Of the consumers surveyed, seventy-four percent thought it (very) bad if a merchant asked for a surcharge for using a credit card. But when asked about a merchant offering a discount, only forty-nine percent thought it (very) bad, with twenty-two percent neutral and twenty-one percent saying it is a (very) good thing.¹⁴⁴

Whether the Commission's remedy is perceived as a loss or a gain depends on the reference point. The Commission's remedy failed when the reference point was the bundled product, namely an operating system with a media player. The Commission's remedy was a perceived loss in two aspects: getting a "degraded" product (the Windows product without a media player)¹⁴⁵ and effectively paying more for it. Under prospect theory, the perceived loss of one media player (in opting for the *operating system without any media player*) would hurt twice as much as the gain in adding a media player of one's choosing.¹⁴⁶

The failure of the Commission's remedy does not establish by itself the desirability of Microsoft's media player. Prospect theory predicts that consumers would opt for any functional media player coupled with Windows over a Windows-only product. The Commission put itself in an awkward position when it chose as the reference point a bundled operating system, namely an operating system that came with a media player. The Commission believed that consumers and computer manufacturers could choose which

¹⁴² *Id.* at 1456.

¹⁴³ *Id.*

¹⁴⁴ ITM RESEARCH, THE ABOLITION OF THE NO-DISCRIMINATION RULE 7-8 (Mar. 2000), available at <http://www.creditslips.org/files/netherlands-no-discrimination-rule-study.pdf>.

¹⁴⁵ *CFI Microsoft*, ¶ 1171.

¹⁴⁶ The European Commission believed that OEMs would respond to consumer expectations by pre-installing another media player on the version without Windows Media Player. *Id.* ¶ 1204.

competitor's media player, if any, they wanted. Although the Commission properly insisted that the operating system and media player were two separate products, they were nonetheless complementary products. The Commission implicitly believed consumers would derive greater satisfaction in choosing a media player (than the pain they felt in not getting a media player with the operating system).

One alternative solution was differential pricing. Suppose one could measure in money the utility one derived from getting Windows Media Player with the operating system. The Commission could require Microsoft to discount its Windows operating system without Windows Media Player by 2 to 2.5 times that amount. One problem is that this utility measure does not necessarily comport with Microsoft's costs. Plus, the remedy increases the Commission's regulatory role for a product that is freely available on the Internet.¹⁴⁷ This option is undesirable.

Instead, under prospect theory, the European Commission should have moved the reference point in the opposite direction such that consumers would have perceived a Microsoft Windows operating system with its Media Player as a loss. The Commission never asserted that operating systems and media players were unrelated. Rather, the Commission correctly asserted that it was unnecessary for *Microsoft's* media player to be bundled with its operating system. Thus, the Commission could have established as the reference point an operating system that came with the choice among several media players. Now the reference point is a Windows operating system with the choice of three media players. So now suppose you can choose between a Windows product that came with the choice of three media players and one that came only with Windows Media Player. Which would you choose?

Consumers would likely perceive a Windows operating system that comes only with one option (Windows Media Player) as a perceived loss. So the loss of two additional options would likely hurt far more than the pleasure gained from not having to choose among the three options. Moreover consumers prefer having some choices rather than no choice.

E. The Commission's Reappraisal of its Behavioral Remedy in the Internet Browser Settlement

The Commission learned from its mistake. It experimented with this superior reference point when it later challenged Microsoft for tying its web browser, Internet Explorer, to its personal computer operating system, Windows.¹⁴⁸ Before the settlement, consumers who used Windows had

¹⁴⁷ *Id.* ¶ 968.

¹⁴⁸ Press Release, European Commission, Antitrust: Commission Welcomes Microsoft's Roll-Out of Web Browser Choice, IP/10/216 (Mar. 2, 2010), available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/216&format=HTML&aged=0&language=EN>.

Microsoft's Internet Explorer as their default web browser. Although consumers could download other web browsers from the Internet, many did not, a function not attributable necessarily to the superiority of Microsoft's Internet browser but again to status quo bias.¹⁴⁹

With its experience from its media player remedy, the Commission shifted to the superior reference point: "The commission had suggested to Microsoft that consumers be provided with a choice of web browsers,' the EC wrote regarding the standalone software proposal. 'Rather than more choice, Microsoft seems to have chosen to provide less.'"¹⁵⁰

As part of its settlement, Microsoft must provide a Browser Choice Screen to consumers within the European Economic Area for five years. Rather than having one Internet browser as the default, computer users must choose whether they want a browser, and if so, which browser they want to install from the competing web browsers listed on the screen.¹⁵¹ Five Internet browsers are identified, with a short description of each, along with links for further information.¹⁵²

F. The Remedy's Advantages and Shortcomings

The Commission's browser remedy is superior under prospect theory to its earlier media player remedy. How effective the settlement has been to date is another matter.

On the one hand, Microsoft's share of the European browser market declined after the settlement—from 44.9 percent in January 2010 to 39.8 percent in October 2010.¹⁵³ Microsoft has a lower market share in the European Union, where consumers are given a choice, than elsewhere in the world, where Windows users must download an alternative browser.¹⁵⁴

¹⁴⁹ Shane Frederick, *Automated Choice Heuristics*, in *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT* 555 (Thomas Gilovich, Dale Griffin & Daniel Kahneman eds., Cambridge Univ. Press 2002) (summarizing experimental evidence of peopling preferring current options over other options to a degree that is difficult to justify).

¹⁵⁰ Ryan Singel, *EU Criticizes Microsoft's IE Unbundling, but Does It Matter Anymore?*, *WIRED*, June 12, 2009, <http://www.wired.com/business/2009/06/eu-criticizes-microsofts-ie-unbundling-but-does-it-matter-anymore/>.

¹⁵¹ Summary of Commission Decision of 16 December 2009 Relating to a Proceeding under Article 102 of the Treaty on the Functioning of the European Union and Article 54 of the EEA Agreement (Case COMP/39.530 – Microsoft (Tying)), 2010 O.J. (C 36) 06, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:036:0007:0008:EN:PDF>.

¹⁵² Browser Choice, Select Your Web Browser(s), http://www.browserchoice.eu/BrowserChoice/browserchoice_en.htm.

¹⁵³ In 2009, Microsoft's share declined by 5.5 percentage points; in 2008 by 8 points. Kevin J. O'Brien, *European Antitrust Deal With Microsoft Barely Affects Browser Market*, *N.Y. TIMES*, Oct. 10, 2010, <http://www.nytimes.com/2010/10/11/technology/11eubrowser.html?ref=business>.

¹⁵⁴ As of April 2011, Microsoft's Internet Explorer accounted for 55.11 percent of the global usage of browsers, Mozilla's Firefox had 21.63 percent, Google's Chrome had 11.94

Moreover, according to one report, downloads of Opera Software's desktop browser "increased in number significantly after Microsoft started offering Windows users in Europe a choice in browser with a so-called ballot screen" with "on average, more than half of the European downloads of Opera's latest browser com[ing] directly from that Choice Screen."¹⁵⁵ The remedy enables consumers to easily choose a browser; it increases the likelihood that the market share reflects more the consumers' informed choice, rather than the monopolist's.¹⁵⁶

On the other hand, even before the settlement, Microsoft's browser market share was declining.¹⁵⁷ Microsoft's share could have declined absent the remedy. But a greater issue is choice overload. Providing consumers some choice is better than no choice. But, providing more choices as the remedy has at least two limitations.

First, offering too many choices can be self-defeating. For example, having consumers choose among sixteen options may lead to a worse outcome than choosing among five. Consumers may demand more choices than they actually prefer. Under loss aversion, consumers hate giving up options and restricting their choice set.¹⁵⁸ But when faced with many choices, some consumers avoid choosing any option, even when the choice of opting out has negative consequences for future well-being.¹⁵⁹ Other consumers choose an option, but have lower confidence in their choice and greater dissatisfaction in choosing. Thus too many choices can lead to a

percent, and Apple's Safari held 7.15 percent. Net Market Share, Browser Market Share, <http://marketshare.hitslink.com/browser-market-share.aspx?qprid=0&qptimeframe=M>.

¹⁵⁵ Robin Wauters, *Microsoft's European Browser Choice Screen Causes Spike in Opera Downloads*, TECH CRUNCH, Mar. 18, 2010, <http://techcrunch.com/2010/03/18/microsofts-european-browser-choice-screen-causes-spike-in-opera-downloads/>.

¹⁵⁶ Ciriolo, *supra* note 10, at 3 (noting how 25 percent of the consumers who viewed the Choice Screen chose an alternative browser).

¹⁵⁷ *Id.*

¹⁵⁸ In one computer experiment, participants tried to keep options open even when counter-productive. DAN ARIELY, PREDICTABLY IRRATIONAL: THE HIDDEN FORCES THAT SHAPE OUR DECISIONS 142-48 (2008). In the Door Game, each MIT student could click on three doors on the computer screen to find the room with the biggest payoff (between 1 and 10 cents). Each student was given 100 clicks, and could click one door as many times possible without a penalty. Each time the student sampled another door, that switch cost the student one additional click. Experiment 2, the Disappearing Door Game, was the same as the Door Game except each time a door was left unvisited for 12 clicks, it disappeared forever. To keep options open, participants in Experiment 2 ended up making substantially less money (about fifteen percent less) than participants in Experiment 1. Participants would have made more money by sticking to one door. *Id.* at 147. A similar result occurred when participants were told the exact monetary outcome they could expect from each room.

¹⁵⁹ Botti & Iyengar, *supra* note 53, at 25 (discussing information overload, where an increase in options raises the cognitive costs in comparing and evaluating the options and leads to suboptimal decision strategies).

worse result for consumers and firms, such as not choosing any browser or regretting one's choice.¹⁶⁰

A second shortcoming with the Commission's choice screen remedy is the lack of any feedback loop, whereby consumers can test the products and compare their performance. For search engines, the consumer can see the number and quality of results for a search term. But benchmarking web browsers and media players may be harder. To the extent the choice screen provides consumers a way to compare the products' performance on popular metrics, the more likely the consumer's choice will be informed.

IV. CONCLUSION

By enriching competition policy with the behavioral economic findings, we can see the importance of trial-and-error feedback loops to the competitive process, and as a potential entry barrier. We can see how monopolists can use heuristics and biases (such as the status quo bias) to maintain their monopoly. We also can see how the antitrust authority can use behavioral economics to design better remedies.

One may question the extent to which defaults matter going forward for technological innovation. Consumers arguably are more comfortable with computer technology. Indeed Apple's Steve Jobs discussed the post-personal computer world of handheld devices,¹⁶¹ where Microsoft lagged.¹⁶² Many consumers today search and download applications (apps) for their mobile telephones and iPads.¹⁶³ Downloading itself may become dated with cloud computing. It is fitting that the same week that the United States antitrust

¹⁶⁰ The bounded rational firms, as a result, lose sales opportunities of their products. Iyengar and Lepper, in their famous experiment, set up a tasting booth in an upscale grocery store. The booth displayed either six or twenty-four different flavors of jam. A greater percentage of the shoppers stopped to sample one of the displayed jams when the booth had twenty-four jam flavors (60 percent versus 40 percent when booth displayed six jam flavors). But a lower percentage actually purchased a jar of jam (3 percent versus 30 percent of customers when booth had only six flavors). Sheena S. Iyengar & Mark R. Lepper, *When Choice Is Demotivating: Can One Desire Too Much of a Good Thing?*, 79 J. PERSONALITY & SOC. PSYCHOL. 995 (2000).

¹⁶¹ Brier Dudley, *Feisty Steve Jobs Talks Up Apple's 'Post-PC' iPad 2*, SEATTLE TIMES, Mar. 2, 2011, http://o.seattletimes.nwsourc.com/html/business/technology/2014381153_brier03.html.

¹⁶² In a recent Nielsen survey of U.S. mobile consumers for January 2011 to March 2011, 31 percent of consumers who plan to get a new smartphone indicated that Android was now their preferred operating system, 30 percent preferred Apple's iOS, 11 percent identified RIM/Blackberry, and 6 percent identified Windows Phone devices (nearly 20 percent were unsure what to choose next). Robin Wauters, *Nielsen: Consumer Desire for Android Grows, Unlike iOS and Blackberry*, TECH CRUNCH, Apr. 26, 2011, <http://techcrunch.com/2011/04/26/nielsen-consumer-desire-for-android-grows-unlike-ios-and-blackberry/>.

¹⁶³ Bryan M. Wolfe, *The Number of Apps Downloaded Each Day Reaches 30 Million*, APP ADVICE, Jan. 20, 2011, <http://appadvice.com/appnn/2011/01/number-apps-downloaded-day-reaches-30-million> ("average number of apps downloaded to every iPhone/iPod touch and iPad is more than 60").

consent decree with Microsoft expired, two other things happened. First, Google announced its Chromebook, whereby the user accesses its data and applications through the Internet. The computer has no operating system (which would require downloads, updates, and so forth). As advertised, it can be thrown into a lake without losing any data. Second, Microsoft announced its purchase of Skype. Microsoft hopes Skype will provide greater inroads in social networks, which, like Facebook, the most popular visited site, do not require downloads, but can be accessed anywhere.¹⁶⁴ Moreover, the European Commission was unconcerned about Microsoft's tying Skype to its operating system, as consumers appeared comfortable downloading other versions.¹⁶⁵

Nonetheless defaults will continue to be an issue. Competitors in South Korea, for example, have complained to the Korean FTC of Google offering its Android system for free with smartphones.¹⁶⁶ Android smartphones use Google as the default search engine.¹⁶⁷ Google notes that Microsoft's Bing has gained in popularity, "perhaps because it comes pre-installed as the search default on over 70 percent of new computers sold."¹⁶⁸ Bing is "also the exclusive search provider for Yahoo! and Facebook."¹⁶⁹ It is technically possible to switch to competing search applications, but the competitors argue, as did Microsoft's competitors in the earlier antitrust cases, it is not easy.¹⁷⁰ They complain that their applications cannot be preloaded on the smartphone.¹⁷¹

Consequently, besides the familiar arsenal of exclusionary and predatory practices, monopolists will exploit consumer biases and heuristics, such as status quo bias and the sunk cost fallacy, to attain or maintain their monopoly. The advances in behavioral economics can help explain the behavior observed in the marketplace and design better remedies.

¹⁶⁴ Richard Waters, Tim Bradshaw & Maija Palmer, *Microsoft in \$8.5bn Skype Gamble*, FIN. TIMES, May 11, 2011, at 1.

¹⁶⁵ European Commission, Press Release, Mergers: Commission Approves Acquisition of Skype by Microsoft, IP/11/1164 (Oct. 7, 2011).

¹⁶⁶ Mark McDonald, *2 Korean Search Engines File a Complaint Against Google*, N.Y. TIMES, Apr. 15, 2011, at B3.

¹⁶⁷ *Id.*

¹⁶⁸ *Senate Google Hearings*, *supra* note 55, at 4 (Testimony of Eric Schmidt, Executive Officer, Google Inc.).

¹⁶⁹ *Id.*

¹⁷⁰ McDonald, *supra* note 166, at B3.

¹⁷¹ *Id.*