

Online Dynamic Pricing:
Efficiency, Equity and the Future of E-commerce

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I. Introduction

1. Customers of Amazon.com, the behemoth e-commerce retailer, were recently startled and quite upset when they learned that the online mega-store was charging different customers different prices for the same DVD movies. [1] Amazon, it appears, was engaging in a form of "dynamic pricing" — an innovative pricing mechanism made possible by recent advances in information technology. By using the plethora of information gathered from customers — ranging from where they live to what they buy to how much they have spent on past purchases — dynamic pricing allows online companies to adjust the prices of identical goods to correspond to a customer's willingness to pay. Although Amazon later denied that it was dynamically pricing its DVDs, explaining instead that the price variations were part of a random "price test," many customers were left unconvinced. [2] Amazon and other e-commerce retailers are not the only businesses applying new technologies to pricing systems. Even one of America's best known brick-and-mortar companies, Coca-Cola, was reported to have been recently testing vending machines that adjust the prices of soft drinks according to the surrounding temperature. [3] If industry analysts are correct, dynamic pricing is not just a passing phase, but will soon be a vital part of all commerce in the twenty-first century. [4]

2. Dynamic pricing is not a new concept. As the economist Paul Krugman has pointed out, dynamic pricing is merely a new version of the age-old practice of price discrimination. [5] Yet, what is new about today's form of price discrimination is that current technology has made dynamic pricing not only widely possible, but also commercially feasible. Many industries in the past have attempted to segment their consumer markets in the hope of charging different prices. But the transaction costs of gathering personal information and monitoring purchasing habits to measure a consumer's willingness to pay, not to mention the costs of actually changing prices, had been prohibitive. Now, with the new technology supporting e-commerce, companies are able to obtain all sorts of information provided by Internet users — and some information not explicitly provided — at a minimal cost. Similarly, new technology allows e-commerce companies to change prices with only a minimal amount of time and effort. Thus, it is no surprise that online retailers have been tempted to test the bounds of acceptable price discrimination as they experiment with dynamic pricing.

3. Price discrimination may not be all bad. Indeed, economic theory suggests price discrimination may perhaps promote an efficient use of a society's resources. In many cases, however, efficiency must be balanced against the need to achieve equitable treatment of individual consumers. In such cases, government regulation, either through existing laws or new ones, may be necessary to ensure that the logic of efficiency does not overwhelm the need for fairness.

4. The aim of this article is to explore the historical, economic, and legal aspects of online dynamic pricing. Part I begins with a brief examination of how Internet price discrimination in many ways parallels the pricing practices instituted by the airline industry during the height of deregulation. Part II discusses how the new technology of e-commerce has taken the age-old practice of price discrimination to new heights. Part III investigates the economic theory that supports the logic of price discrimination. The article ends with a succinct legal analysis of online price discrimination, examining previous attempts to combat price discrimination and suggesting an increased role for formal government institutions to monitor the new pricing practice.

II. The Lessons of History: Deregulation and the Airline Industry

5. Price discrimination has a long and rich tradition. Throughout the history of commerce, charging different prices for identical goods has been a common practice in those markets separated by geography or defined by distinguishable customer types. [6] Movie theaters, buses, trains, airlines, and even amusement parks and restaurants, engage in a form of price discrimination, either offering discounts for children, students, or senior citizens. The airline industry is perhaps the best example of a business that has learned how to reap the benefits of price discrimination.

6. Before the deregulation of the late 1970s and early 1980s, the airline industry was marked by a complex and intricate set of rules and regulations that limited competition. The federal government, through the Civil Aviation Board, controlled prices by standardizing costs and setting profitability targets. [7] Although such regulation kept travel prices relatively stable, the immense amount of government control stifled competition and arguably inhibited industry growth and innovation. With the Airline Deregulation Act of 1978, [8] fierce competition between new and old carriers caused a dramatic decrease in prices and an increase in company bankruptcies, as failing firms were no longer bailed out by federal funds. [9]

7. Reacting to a deregulated market, airlines instituted their own forms of pricing innovations, some of which foreshadowed the dynamic pricing models of online retailers. In the immediate wake of deregulation, airlines quickly realized that uncontrollable price competition was leading to deep discounts that could spell the demise of many carriers. To control such price discounting, airlines first began experimenting with targeted restrictions such as the advance-purchase, Saturday-night stay, and non-refundability requirements that have now become an established part of the airline industry's ticketing practices. [10] Aimed mainly at business travelers, these requirements forced the less price-sensitive, and considerably more profitable, business segment of the airline market to forego some of the price discounts. Non-business travelers, who are usually more flexible and more price-sensitive, were able to obtain discounted fares as long as they were willing to tolerate the new set of requirements. These experiments in distinguishing the demand for air travel proved to be a huge success, as business travelers were, in fact, forced to forego many of the restricted discounts.

8. With the initial success of segmenting business travelers, the airlines soon developed more sophisticated pricing systems. By compiling enormous amounts of reservation and sales data and analyzing consumer travel patterns, airlines developed complex statistical and economic models that allowed them to calculate the optimal amount of discounted fares for each flight. The airlines employed some of the early supercomputers to monitor and manage these multifaceted reservation models. A new age of "revenue management" was born, and technology was the midwife. [11]

9. The airline industry's response to the intense competition brought forth by deregulation seems to be reappearing in a new incarnation: the current pricing innovations of e-commerce. Although the initial evolution of e-commerce has occurred in the context of limited regulation, e-commerce and the post-regulation airline industry have much in common. Not only can airline reservations be viewed as among the first "electronically distributed" goods that share the same flexibility now found in much of e-commerce, [12] but more importantly, many e-commerce companies face the same risks of destabilizing competition that haunted the early years of airline deregulation. Even with the recent meltdown of many e-commerce companies, the competition for digital space remains fierce. Furthermore, the numerous pricing innovations emerging from e-commerce — from auctions to buy-driven contracts to dynamic pricing — all suggest that new economy companies are learning from the past, as they institute their own segmentation strategies to control and manage pricing. [13]

III. The New Technology

10. What separates today's e-commerce pricing strategies from past attempts to manage revenue is the increasing role played by new technology. Though technology has always fueled the sophistication of pricing models, the present technological revolution has expedited the pricing process, while enhancing the future possibilities of revenue management. There is no doubt that e-commerce has been growing at an astronomical rate. Recent industry estimates suggest that online sales will reach approximately \$100 billion by 2003, a 12-fold increase from 1998. [14] As e-commerce continues to grow, technology is certain to play an increasing role in marketing and pricing practices.

11. Online dynamic pricing is possible today mainly because of recent advances in technology. The Internet, and the e-commerce it has spawned, not only provide e-retailers with the ability to transform list prices quickly and easily, the new technology also allows online companies to gather and analyze customer information at an unparalleled pace. First, online-based companies are not subject to the "menu costs" of price changes associated with designing new advertising, creating new catalogues and retagging current merchandise. [15] Now, with a few clicks of a mouse, all this and more can be done merely by updating a Web page. Second, new technology also permits online companies to customize their marketing and pricing to fit particular market segments. In cyberspace, the relationship between retailers and consumers is not one-way street. Instead, there is an implicit amount of interactivity in nearly every purchasing transaction. For example, nearly all online purchases of material goods require a conventional mailing address — an address that can tell a business a great deal about the background of a particular customer. Mail-order catalogue companies have long relied on the subtle meanings behind postal addresses to adjust prices to more upscale or downscale consumers residing in particular postal zones. [16]

12. E-commerce companies, however, have the potential to take price discrimination to a new level, well beyond customized mail-order catalogues. The speed with which information can now be gathered, processed, and analyzed has led to a paradigm shift in marketing. As any online shopper can attest, e-commerce companies have already begun to use customer data to make personalized recommendations for future purchases. [17] Making recommendations is just the beginning. Whereas past forms of price discrimination have used limited personal information — relying principally on general demographics — online companies now have the technological capability to fine-tune their data collection and marketing strategies. By using data from the actual behavior of individuals, e-commerce companies have the potential to micro-manage their marketing and pricing strategies, so as to customize nearly every sales offer.

13. There are many technological tools that allow for such online micro-marketing. Computer "cookies," for instance, allow Web sites to record on to an Internet user's own hard drive the information about the user's past interactions with the Web site. Using such stored information, Web sites can tailor subsequent interactions with these users based on past viewing preferences. [18] Likewise, "click-stream" technology allows a Web site to track the paths that users take as they view advertisements, different Web pages on the site, and even links to other sites. [19] Software vendors, moreover, have already developed sophisticated databases that not only keep track of what individual customers have previously purchased, but also process the vast amount of information gathered through various technologies. With this enhanced technology, online companies have the potential power to use an unprecedented amount of consumer information in tailoring their pricing strategies.

14. The benefits of new technology do not accrue only to e-commerce companies. Consumers have also been empowered with the ability to counter many of the current micro-marketing tools. If the success of online dynamic pricing rests on the asymmetry of information between consumers and retailers, new technology may hold the promise of "blowing" such asymmetries to "bits." [20] The explosion of shopping comparison Web sites and the prevalence of "shopping bots" used by consumers to track competitive prices are just two examples of how technology can be used by consumers to combat the potentially exploitive practices of dynamic pricing. [21]

IV. The Economics Behind Dynamic Pricing

15. Economic theory has demonstrated the social benefits, and perhaps even the necessity, of price discrimination. Although most textbooks dealing with economics discuss price discrimination only in the context of monopoly power, [22] the notion of charging different individuals different prices for the same good or service may also appeal to those industries with inherently high fixed costs. In those cases where start-up costs are high, but operating expenses are relatively low, price discrimination may lead to a socially efficient use of resources. Consider the airline industry again. The start-up costs of creating a new airline are enormous. The expense of purchasing or even leasing a fleet of planes by itself requires a substantial amount of capital. But once an airline has covered its initial fixed costs, the marginal expense of flying an additional passenger is relatively small — in some cases literally "peanuts." [23] For such high fixed cost/low marginal cost industries, price discrimination is not just a boon; it is a necessity.

16. Without a sufficient amount of demand for air travel, airlines would not be able to cover their high initial fixed costs, not to mention their marginal expenses. But because airlines are able to charge some customers more — namely less price-sensitive business travelers — they are able to cover their fixed costs, while offering less expensive fares to the more price-sensitive leisure travelers. If carriers were forced to sell all their seats at the same price, they would, in theory, likely not raise enough revenue to cover their fixed costs. Hence, they would possibly be forced out of business, or would price-out a significant portion of their customer base and not optimize their profits. By charging different prices, airlines are able to provide their services to both sets of travelers — at prices often below their respective absolute willingness to pay. Such differential pricing has the added advantage of allowing the airline companies to optimize their profits. [23]

17. Airlines are not the only companies dependent upon price discrimination. Just about any industry that faces a high set of fixed costs and relatively low variable costs — such as book publishing or the movie industry — will resort to some form of price discrimination. [24] Indeed, today's digital economy is filled with numerous firms defined by a structure of high fixed costs and low marginal costs. The technology of digitalization itself has transformed the cost structure of many industries competing in cyberspace. Internet publishing, for example, has dramatically reduced the marginal cost of producing magazines and journals. [25] In theory, nearly anyone with a desktop publishing program can put together an online newsletter or periodical with little expense. But, as the continuous proliferation of Web sites suggests, just having a presence online is generally not enough. Contrary to conventional wisdom, entry into the world of digital publications is not as facile as it may first appear. Any serious online publisher must devote a significant amount of initial resources to developing a brand name, and this development often entails a well-funded advertising and marketing budget. Thus, the high fixed costs of developing an online brand, together with the low marginal cost of reproducing digital products has come to define the cost structure of Internet publishing. [26]

18. Other online companies face similar concerns. Because much of cyberspace remains uncharted territory, e-commerce companies have been engaged in a race against time to be the first to claim key digital space as part of their branding and marketing efforts. While the operating expenses of providing their goods and services may have been decreased by the efficiencies of new technologies, the initial fixed cost of developing a reliable brand remains relatively high. [27] With these cost requirements, many e-commerce companies may feel compelled to charge different prices for the same goods and services.

19. The question remains, however, whether such price discrimination is fair. When two reasonably similar individuals are charged different prices for the same goods and services, there seems to be something patently wrong. Price discrimination appears to elicit a visceral negative reaction. Airline customers, in particular, are often astonished and irked when they learn what others seated next to them have paid for their tickets. On the other hand, many customers may be willing to tolerate a certain amount of price discrimination, if it is necessary to assure the provision of particular goods and services, such as air travel, or if it aids those individuals, such as students and seniors, who are living on a fixed income.

20. However, in those cases where price discrimination is not financially necessary or acceptable, the question becomes: is there any other economic justification for charging different prices for identical goods and services? One answer may be that customized offers add value to online transactions. In the euphemistic language of today's e-commerce, "personalized pricing" could be defended as a measure that provides the latest, up-to-date information to consumers. Customers who are willing to pay more for a broader choice of goods and services may simply view dynamic pricing as an "information fee" levied by retailers who are willing to tailor offers to the past buying habits of consumers — essentially giving them what they want, before they even know it. While such a group of price-insensitive buyers may exist, they are surely in the minority.

21. As an additional justification for dynamic pricing, information technology economists have argued that "personalized pricing" is simply an extension of traditional marketing practices. [28] When the operating costs of reproducing another unit are close to zero — as they are for many information-based industries — companies have an incentive to price their goods according to consumer value, not production costs. Proponents of personalized pricing contend that prices based on value, and not cost, benefit not only companies, but also those consumers who are offered relatively lower priced goods and services, since these consumers pay only as much as they value the good or service.

22. Setting aside economic explanations for dynamic pricing, the concern for equity remains: is it fair to charge different prices for the same items to different people according to their willingness to pay? From a legal perspective, is dynamic pricing a violation of current law? If not, is it because the old laws have not kept up with the new technological changes embodied in e-commerce? Indeed, should there even be a set of rules or regulations governing dynamic pricing?

VI. The Legality of Dynamic Pricing

23. The multitude of issues posed by the advent of the Internet has fundamentally challenged many of the bedrock theories of contemporary law. Law reviews and legal journals, not to mention the popular press, are filled with articles about the present tension between law and technology. Jurisdiction, privacy, intellectual property, criminal law, and free speech are just some of the areas of law that have come under increased strain in the digital age. Although the issue of price discrimination in e-commerce has received little attention, the burgeoning potential of this new pricing strategy has broad implications for the intersection of law and technology. Like other novel issues of cyberspace law, online dynamic pricing begs the question of whether existing legal rules can be used to address the possible unfairness of Internet price discrimination. If current legal rules are inadequate to deal with this new pricing system, perhaps a new legal regime, or some other form of monitored self-regulation, is necessary.

24. At first blush, it appears that existing legal rules could combat the inequity concerns raised by online price discrimination. United States antitrust law, for example, specifically deals with price discrimination. The Robinson-Patman Act of 1936, which amended Section 2 of the Clayton Act, makes it "unlawful for any person . . . to discriminate in price between different purchasers of commodities of like grade and quality . . . where the effect . . . may be substantially to lessen competition or tend to create a monopoly." [29] Simply put, the Robinson-Patman Act "requires that sellers treat all competing customers on the same basis, unless there is some recognized legal justification for different treatment." [30]

25. Despite the broad language of the statute, the Robinson-Patman Act has had limited applicability in the recent past, and may even be irrelevant in the context of online dynamic pricing. The Department of Justice has not enforced the Act since 1977 and the Federal Trade Commission ("FTC") has only used it sparingly. [31] More importantly, Robinson-Patman, as a provision of U.S. antitrust laws, has focused primarily on attacking the anti-competitive dealings of intermediary vendors, rather than on protecting consumer welfare directly. [32] In fact, because the Act is concerned chiefly with preserving the structural integrity of competitive markets, business-to-consumer e-commerce is unlikely to be affected by the statute's provisions. With the large number of e-commerce companies currently competing in the business-to-consumer space, it is highly unlikely that those willing to engage in online price discrimination will have any anti-competitive effects on the market. It is more likely that the large number of competitors (as well as the increasing prevalence of price comparison Web sites and shopping bots) will act as a curb on possible price discrimination. Rational consumers, skeptical of an online company's pricing practices, will take their business to a competing company in whom they have greater trust and faith.

26. Beyond antitrust law, at least one set of consumers has creatively attempted to use existing criminal law to address price discrimination in mail-order catalogues. [33] In 1996, Denise Katzman filed a class action lawsuit against Victoria's Secret Catalogue alleging that the catalogue company violated the Racketeer Influenced and Corrupt Organizations Act ("RICO") by providing different discounts to different groups of customers. [34] Katzman claimed that she received a Victoria's Secret catalogue that offered a smaller discount than a nearby identical catalogue sent to a male co-worker. Moreover, Katzman asserted that in previous years Victoria's Secret also engaged in price discrimination by mailing multiple versions of the same catalogue, offering identical items at different prices to different classes of customers. [35] In her complaint, Katzman argued that the catalogue company's discriminatory pricing structure constituted "racketeering activity under the RICO statute [sic]." [36] To demonstrate the predicate acts of racketeering required by the statute, Katzman contended that sending multiple versions of a mail-order catalogue with different prices for the same goods constituted mail fraud.

27. The courts rejected Katzman's innovative legal arguments. Judge Robert W. Sweet of the U.S. District Court for the Southern District of New York dismissed Katzman's claims, ruling that "offering different discounts to different catalogue customers does not constitute mail fraud under any reading of the law." [37] In addition, Judge Sweet responded that Katzman's filings were "objectively unreasonable." [38] Because defendants were compelled to disclose to "a patently meritorious complaint" that caused "unwarranted adverse publicity," [39] Judge Sweet imposed sanctions against Katzman's attorney for filing a frivolous suit, ordering him to pay defendants legal fees in the amount of \$5,000. [40] The appeals court affirmed Judge Sweet's decision. [41]

28. The rulings in *Katzman* seem to suggest that retailers can, for legitimate business purposes, make distinctions between buyers. As long as the price differences are based on reasonable business practices such as rewarding loyal customers and do not discriminate against race, gender, or other impermissible categories, dynamic pricing appears to be legal. Since current law seems to permit reasonable forms of price discrimination in the tangible world, the issue becomes whether there ought to be a new legal regime for governing online dynamic pricing practices. The normative question turns on whether there ought to be some other form of regulation addressing the evolving pricing practices of e-commerce companies.

29. Denizens of cyberspace — especially businesses occupying digital space — have been advocating self-regulation as the best suited form of governance for the Internet in general, and e-commerce in particular. Some legal commentators have argued that the Internet has developed an indigenous cultural aversion to state intervention, and that bottom-up private ordering and grass-roots social control have become important Internet norms. [42] Although the stability and prevalence of these Internet norms remains a contested issue, [43] the evolution of online privacy policies illustrates the populist penchant for online self-regulation. In the early years of the Internet, Web site privacy policies were quite rare. It was not until some sites began to violate the implied trust of their visitors by revealing personal information that online privacy policies emerged as a competitive, commercial advantage. Those sites with explicit privacy policies garnered more visitors and hence greater advertising revenue. Soon Internet users developed an expectation of privacy and confidentiality in the information that they provided, and online privacy policies became a standard component of nearly every online presence. [44]

30. Online privacy policies did not, however, simply emerge *de novo* from consumer pressure. The formal institutional structure of state regulation also played an important part. In the summer of 1998, the need for online privacy policies was given the force of law when the FTC settled claims against the popular Web site, GeoCities. In response to an FTC complaint alleging that GeoCities had engaged in misleading data collection practices, GeoCities agreed to a consent order that required it to post a clear and prominent notice to members and visitors explaining how their personal information would be collected and used. [45] The consent order naturally captured the attention of many e-commerce companies.

31. The "self-regulation" advocated by the Internet faithful has not meant "no regulation." The Internet community has developed *ad hoc* institutions — such as newsgroups and chat sites — that circulate information and provide the leverage for public pressure against inappropriate cyberspace behavior. Similarly, several online ventures have emerged that attempt to foster the self-regulatory aspects of e-commerce. One such company, TRUSTe, operates much like the better business bureau, stamping its seal of approval on those digital enterprises that conform to established privacy principles and complying with TRUSTe's oversight and consumer resolution process. [46] Several online shopping comparison sites have recently been using these quality control organizations to check the stated business policies and customer relations practices of the e-retailers associated with their sites. [47] Though these quality measurement companies originated with the concern for online privacy, there is no reason why such organizations could not also monitor Internet pricing practices. After all, consumer confidence in the fair pricing procedures of online companies is a critical component in developing the trust necessary to facilitate the growth of e-commerce.

32. It is quite possible that if the Internet community deems dynamic pricing to be a violation of the implicit trust and loyalty of e-commerce, these quality control sites could intervene to prevent consumer exploitation. Even without these sites, Internet consumers appear to be appealing to the underlying competitive nature of e-commerce. Shopping comparison Web sites and shopping bots could be viewed as a market response to the consumer demand for increased information about prices and products. In other ways, the Internet community has already been able to admonish practitioners of price discrimination without the assistance of any formal, institutional intervention. Amazon's experiments with dynamic pricing were ultimately discovered at an online chat site dedicated to DVDs. It was online consumers themselves, connecting and communicating via the Internet and e-mail, who brought a halt to Amazon's "price tests." [48]

33. Yet, despite the success of self-regulation, the decentralized nature of the World Wide Web suggests that there is still a role for law and the formal institutions of the state to circumscribe what could potentially be a highly unfair business practice. Even self-regulation has limits in an environment where technology is constantly improving and the creation of Web sites is escalating at a dizzying pace. If e-commerce continues to grow at the astronomical rate that most experts anticipate, keeping track of the number of proliferating sites and monitoring their quality may require more formal types of collective action. In these instances, the FTC may be the ideal institution to oversee the evolving pricing strategies of e-commerce. The FTC's Bureau of Consumer Protection, for example, has its self-proclaimed mandate the obligation "to protect consumers against unfair, deceptive, or fraudulent practices." [49] Just as it stepped into the fray regarding online privacy policies, the FTC could begin by simply monitoring the pricing practices of e-commerce companies and issuing reports about the status of online dynamic pricing. [50]

34. Presently, the FTC has remained reticent in the discussions concerning online dynamic pricing. But if industry analysts are correct and dynamic pricing becomes the wave of the future, the FTC will have no choice but to intervene to insure that dynamic pricing remains a reasonable business practice — one that does not exploit the potential of new technology to extract a consumer's entire willingness to pay. With its experience in dealing with price discrimination, and its knowledge of e-commerce, the FTC has the authority and capacity to monitor and guide e-commerce pricing practices. That does not mean, however, that the FTC should rule with a heavy hand. Rather, it would be more appropriate for the agency to initially respect the cultural norms of the Internet community, to allow online forms of self-regulation to develop, permitting institutions such as TRUSTe to guide and protect consumer concerns. In monitoring the Internet's attempts at self-regulation, the FTC should intervene in those cases where the competitive forces of the market and the information flow of the Internet community may not be able to keep pace with the escalating dynamics of e-commerce. As a monitoring agency and an arbiter of last resort, the FTC can operate within the indigenously developing norms of the Internet community while insuring the principles of consumer protection.

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** Staff Attorney, Gordon & Gluckson, LLC. The authors would like to thank Lynn Stram for her assistance with this article.

[1] Amazon.com *Varies Prices of Identical Items for What You Pay*, Sept. 7, 2000, at B19.
[2] David Streitfeld, *On the Web, Price Tags Blur; Text, Wall St. J.*, Sept. 27, 2000, at A1. This was not the first time that Internet users noticed Amazon's experiment with dynamic pricing. An academic study in the summer of 2000 and customers in the spring of 2000 also discovered that Amazon was charging different prices to different customers for the same goods. *Id.*
[3] *Id.* See also Camillo Fracassini, *Amazon "Hikes Prices" for Loyal Shoppers*, SCOTLAND ON SUN., Oct. 1, 2000, at 12.
[4] Janet Adams, *E-Tailer Price Tailoring May Be Wave of Future*, CHI. TRIB., Sept. 25, 2000, at 4C.
[5] Paul Krugman, *What Price Fairness?*, N.Y. TIMES, Oct. 4, 2000, at A35.
[6] Economists technically define price discrimination by different rates of return, or differences in net prices. That is, two sales are discriminatory when they have different rates of price to marginal cost. Louis Phillips, *Price Discrimination*, in THE NEW PALGRAVE: A DICTIONARY OF ECONOMICS 952, 952-54 (John Eatwell, et al. eds., 1987). See also HERBERT HOVENKAMP, FEDERAL ANTI-TRUST POLICY: THE LAWS OF COMPETITION AND ITS PRACTICE §14.1 (2nd ed. 1999).
[7] Beginning in 1938, domestic airlines were under the purview of the Civil Aeronautics Board, the precursor of the Civil Aviation Board, which regulated not only prices and profitability, but routes, service, and even entry into the industry. See generally Suzanne Innes, Comment, *Airline Passenger Facility Charges: What they Mean for the Airline Industry?*, 60 J. AIR L. & COM. 1039, 1042 (1995).
[8] Pub. L. No. 95-504, 92 Stat. 1705 (1978) (codified as amended in scattered sections of 49 U.S.C.).
[9] Laurence E. Reszel & Martin T. Farris, *Airline Deregulation: An Evaluation of Goals and Objectives*, 21 TRANSP. L.J. 105 (1992).
[10] Garrett van Ryzin, *Survey — Mastering Management: The Brave New World of Pricing*, FIN. TIMES (London), Oct. 16, 2000, at 6 [hereinafter *Survey*].
[11] See generally R.B. CROSS, REVENUE MANAGEMENT: HARD-CORE TACTICS FOR MARKET DOMINATION *passim* (1998); Jeffrey L. McGill & Gareth I. van Ryzin, *Revenue Management: Research Overview and Prospects*, 33 TRANSP. SCI. 233 (May 1999).
[12] Like many of the goods and services sold over the Internet today, airline tickets represent a contractual right to the performance of a service, namely transport. This contractual right can be distributed in purely electronic form. The recent prevalence of e-tickets by most airlines demonstrates the "electronically distributed" nature of airline reservations. *Survey*, *supra* note 10.
[13] For more on the innovative pricing systems of e-commerce, see generally Whit Andrews, *The New Laws of Dynamic Pricing*, INTERNET WORLD MAGAZINE/INTERNET WORLD.COM, at <http://www.internetworld.com/12/15/99/1215Commerce.asp> (Dec. 15, 2000).
[14] Suzanne Kabner, *Online vs. in-Line: Can International Retailers Catch the Dot-coms?*, at <http://www.abnewsws.go.com/Sections/Business/TheStreet/2001/092028.html> (May 28, 1999). According to Forrester Research, Worldwide Internet Commerce will reach approximately \$66.8 trillion in 2004. Forrester Findings, *Internet Commerce*, at http://www.forrester.com/ER/Press/Parr/End01_1768.0_FF.html (last visited Aug. 25, 2001).
[15] Although economists generally define "menu costs" as the expense of changing prices during inflationary periods, discriminatory pricing may potentially give rise to similar costs associated with the process of changing prices. DONALD RUTHERFORD, DICTIONARY OF ECONOMICS 295 (1992).
[16] Marilyn Much, *Catalogs Shred Privacy: The Newest Type of Bias?*, INVESTORS BUSINESS DAILY, Jan. 18, 1996, at A4.
[17] See Dylan Tweney, *Punting on Personalization*, ECOMPANY, at http://www.ecompany.com/articles/06b/01_1653R713.00.html (Oct 12, 2000).
[18] For more on cookies, see generally Federal Trade Commission, *Privacy Online: A Report to Congress*, at n 4 (June 1998); Justin Hart, *Will the Cookie Crumble?* THE GUARDIAN (London), Aug. 3, 2000, at 9.
[19] Don Nachtwey, *Up Close and Personal*, Intelligent Enterprise, at <http://www.intelligententerprise.com/000929/feat5.shtml> (Sep. 29, 2000).
[20] See generally PHILIP EVANS & THOMAS S. WURSTER, BLOWN TO BITS: HOW THE NEW ECONOMICS OF INFORMATION TRANSFORMS STRATEGY 28-30 (Harvard Business School Press ed., 2000).
[21] See Jason Compton, *Robot Pricing Tool Fueling Online Duel*, CHI. TRIB., Nov. 27, 2000, at B1; Phil Patton, *Buy Here, and We'll Tell You What You Like*, N.Y. TIMES, Sept. 22, 1999, at G22.
[22] See generally Paul A. Samuelson & William D. Nordhaus, *ECONOMICS* 617-19 (Elisa Adams et al. eds., 13th ed. 1989).
[23] A simple numerical example may highlight the social efficiency of price discrimination. Suppose that an airplane can be hired at a cost of \$200. Suppose further that five business travelers are willing to pay \$25 each to travel, while another 10 leisure travelers are only willing to pay as much as \$10 each. If the price of travel is set at \$10, all 15 potential customers will be willing to buy, but the total revenue of \$150 is not sufficient to cover the airplanes costs. If the price is set higher than \$10, the leisure travelers are priced out of the market, and the airplane company can only make a maximum of \$125 from the business travelers — still not enough to cover costs. If the company can distinguish between the two sets of travelers — business and leisure — and charge the different prices according to their willingness to pay, the company could cover its costs, and at the same time satisfy both sets of passengers. Charging business travelers \$24 and leisure travelers \$9 would satisfy both sets of travelers (allowing them to pay less than their respective maximum willingness to pay), and yield the airplane company a profit of \$10. For a similar example see, Scott Woolley, *I Got It Cheap Than You*, FORBES, Nov. 2, 1998, at 82.
[24] Book publishers price discriminate by charging higher prices for the initial run of hardback books, as opposed to the paperback prices of subsequently released versions. Similarly, the movie industry price discriminates not only in charging different prices for different customers, such as adults versus students and senior citizens, but also by releasing video and DVD versions of movies well after the initial run. Online companies also use this strategy of delay by charging customers more for more up-to-date information. For example, online brokers often charge more for real-time stock quotes." See CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 4, 53-82 (Harvard Business School Press ed., 1999).
[25] See generally INTERNET PUBLISHING AND BEYOND: THE ECONOMICS OF DIGITAL INFORMATION AND INTELLECTUAL PROPERTY (Hal R. Varian & Brian Kahin eds., MIT Press ed., 2000).
[26] For those e-commerce companies that already have a sustained brand in the world of bricks-and-mortar, the establishment of an online presence may not be as costly. But the start-up costs of transforming a well-known brand into an online presence remain. See Erick Schonfeld, *Schwab Pays It All Online*, FORTUNE, Dec. 7, 1998, at 94.
[27] See Shapiro and Varian, *supra* note 24, at 19-52.
[28] 15 U.S.C. § 13(a) (2001).
[29] David A. Balto, *Emerging Antitrust Issues in Electronic Commerce*, Speech Before 1999 Antitrust Institute (Nov. 12, 1999), Distribution Practices: Antitrust Counseling in the New Millennium, at <http://www.ftc.gov/speeches/other/eecommerce.htm>.
[30] Hovenkamp, *supra* note 6, at 572.
[31] A recent example of a Robinson-Patman case is *National Ass'n of Coll. Bookstores v. Cambridge Univ. Press*, 990 F. Supp. 245 (S.D.N.Y. 1997).
[32] Katzman v. Victoria's Secret Catalogue et al., 167 F.R.D. 649 (S.D.N.Y. 1996). Although it is unclear whether e-commerce issues could be governed by conventional mail-fraud provisions, the pricing practices of mail-order catalogue companies are analogous to online dynamic pricing. See Joseph P. Bailey, *Intermediation and Electronic Markets: Aggregation and Pricing in Internet Commerce*, 124-25 (1998) (unpublished Ph.D. dissertation, Massachusetts Institute of Technology) (available at <http://www.rhsmith.edu/abdu01pp/bailey/pubs/pdhdthesis.html>).
[33] 18 U.S.C. §§ 1961, 1962 (2001). Although RICO is essentially a criminal statute, it does provide for civil damages to private parties who have been injured "by reason of" a RICO violation. 19 U.S.C. § 1964(c).
[34] Katzman, 167 F.R.D. at 654.
[35] *Id.* at 660. Katzman also sued under the Lanham Act, claiming that Victoria's Secret's price discrimination was a form of misrepresentation amounting to trademark infringement. The court dismissed this claim for lack of standing. *Id.* at 658.
[36] *Id.* at 660.
[37] *Id.* at 661.
[38] *Id.* For more on Katzman's legal counsel, see generally Amy Stevens, *Tempest in a C Cup: What's Underneath Victoria's Secret Suit: A Lawyer and His Friend Get Different Catalogs*, 96-7929 to the Courthouse, WALL ST. J., May 1, 1996, at A1.
[39] Katzman v. Victoria's Secret Catalogue, No. 79-7929, 1997 U.S. App. LEXIS 16440 (2d. Cir. 1997).
[40] The issue of Internet governance has been a popular topic among legal scholars. Some of the more thoughtful scholarship supporting online self-governance includes: David R. Johnson & David Post, *Law and Borders — The Rise of Law in Cyberspace*, 48 STAN. L. REV. 1367 (1996); Trotter Hardy, *The Proper Legal Regime for Cyber-Past*, 55 U. PITT. L. REV. 993 (1994); Henry H. Peritt, Jr., *Stagnant Self-Governance: Town Hall Democracy or Redivivous Royalties?* 12 BERKLEY TECH. L. J. 413 (1997).
[41] Legal scholars have also questioned the effectiveness of self-regulation of cyberspace based on social norms. Among these critiques are: Neil Weinstock Netanel, *Cybercapes of Interest Norms: A Skeptical View from Liberal Democratic Theory*, 88 CAL. L. REV. 395 (2000); Mark A. Lemley, *The Law & Economics of Internet Norms*, 73 CHI-KENT L. REV. 1257 (1998).
[42] Seth Fineberg, *Candiness is Key: New Study Looks at Evolution of Privacy Policies*, CHANNELSEVEN, Apr. 12, 2000, at http://www.channelseven.com/admsight/surveys_research/2000/features/survey_20000412.shtml.
[43] "FTC and GeoCities Settle First Internet Privacy Lawsuit," COMPUTER LAW STRATEGIST, Sept. 1998, Vol. 15, No. 5, P. 9.
[44] See generally *The TRUSTe Story*, at http://www.truste.com/about/about_truste.html.
[45] The popular technology Web site CNET.com, for example, recently began using merchant review ratings provided by Gomez.com, in its Amazon price comparison Web pages. See *MySimon Recognized for Excellence by Industry Expert*, PR NEWSWIRE, Sept. 13, 2000, available in LEXIS, News 4, at 14; Linda Rosencrance, *Outrage prompts Amazon to Change Price-testing Policy*, COMPUTERWORLD, Sept. 18, 2000, at 14.
[46] FTC, *Profile of the Bureau of Consumer Protection* (emphasis added), at <http://www.ftc.gov/bcp/bcp.htm>.
[47] How the FTC chooses to act could well depend upon whom dynamic pricing affects the most. If online dynamic pricing is gouging affluent Internet consumers, one may wonder if such a privileged group may not have more effective means, namely its consumer power, to combat such pricing practices.