Economics at the FTC: Non-Price Merger Effects and Deceptive Automobile Ads

Matthew Jones
Bruce Kobayashi
Jason O'Connor

December, 2018

Abstract: Economists at the Federal Trade Commission (FTC) analyze a wide range of activities, practices, and policies in support of the agency's consumer protection and competition missions as demonstrated by the two economic analyses discussed in this article. The first section of this article describes the economic analysis of a proposed merger's impact on non-price dimensions of competition in the daily fantasy sports market. The second section builds an economic model to quantify the harm to consumers from deceptive advertising in automobile markets.

Keywords: Antitrust, Consumer Protection, Deception, FTC, Mergers, Non-Price Competition

Address for all authors:
Federal Trade Commission, Bureau of Economics
600 Pennsylvania Ave., N.W.
Washington, DC 20580, U.S.A

Acknowledgements We thank Tim Brennan, Dina Mayzlin, Jan Pappalardo, Debra Ringold, Dave Schmidt, and Mike Vita for very helpful comments. The views that are expressed in this article are those of the authors and do not necessarily reflect those of the Federal Trade Commission or any of the individual Commissioners.

Note: a final version of this paper was published in the December 2018 issue of the Review of Industrial Organization, 53: 593, https://doi.org/10.1007/s11151-018-9669-1.

I. Introduction

The staff of the Federal Trade Commission's Bureau of Economics (BE) is composed of about 75 Ph.D. economists, a few financial analysts, and about 20 other staff: primarily research analysts. BE supports the FTC's two primary missions: competition (antitrust), and consumer protection. Providing economic analysis that relates to the Commission's law enforcement activities (i.e., investigations and litigation) is BE's primary role; but FTC economists also engage in "competition advocacy" before other government agencies on state and federal laws and regulations that relate to the FTC's primary missions and interact with counterparts at foreign agencies. Finally, BE's staff are actively engaged in policy-oriented economic research.

Review of the competitive effects of proposed mergers is the most common means by which economists contribute to the FTC's competition mission. The FTC brought enforcement actions against 23 mergers in FY2017. Fifteen of those were resolved with consent orders under which the merger could proceed subject to certain conditions; six mergers were abandoned or restructured during the investigation, requiring no additional conditions; and the Commission filed a complaint in federal court to enjoin two of the transactions. The FTC brought actions in nine non-merger antitrust matters in FY2017, three of which were resolved with consent agreements while the Commission filed challenges either in federal court or under its own administrative adjudication process in the remaining six.[1] The Commission also took actions in over 70 consumer protection actions in 2017 that covered a wide assortment of activities, including deceptive advertising and wire fraud (Federal Trade Commission 2018). The economic impact of FTC decisions can be substantial. For example, FTC consumer protection and competition enforcement actions combined resulted in over $5 billion in redress and disgorgement in 2017. (Federal Trade Commission 2018).

BE economists are also active participants in the larger economics community. Our economists regularly publish original research articles in academic journals, participate in conferences, and maintain an active seminar series. BE continues to organize an annual FTC Microeconomics Conference, which marked its tenth year in November of 2017.[2] Some of the topics considered in the paper sessions, panel discussions, or keynote addresses included new

[1] A table of these merger and non-merger enforcement statistics dating back to 1996 is available at https://www.ftc.gov/competition-enforcement-database.

[2] The conference website is located at https://www.ftc.gov/news-events/events-calendar/2017/11/tenth-annual-federal-trade-commission-microeconomics-conference.

behavioral models, cross-market mergers, privacy and data security, and empirical evidence on market structure and competition. The next FTC Microeconomics Conference will take place on November 1-2, 2018 in Washington, DC.[3]

This article discusses two economic analyses performed by BE economists to support our competition and consumer protection missions. Section II of this article discusses the evaluation of the potential non-price effects of a merger of websites that run paid daily fantasy sports ("DFS") contests. On November 17, 2016, DraftKings and FanDuel entered into an agreement to undertake a "merger of equals" (Federal Trade Commission 2017). The FTC alleged that these two firms competed aggressively against each other on price and non-price factors to win and retain users. While evaluation of the effect a merger can have on prices is often fertile ground for economic analysis in merger review, non-price effects are not as commonly addressed. So, while the FTC did allege that this merger would result in higher prices that would harm consumers, this article will focus on the analysis of how the merger would affect the non-price dimensions of competition in the DFS market.

Section III of this article describes a conceptual approach to quantifying in dollars the harm to consumers that is caused by deceptive advertising by automobile dealers. Even when the available case-specific data is very limited, the model can be used to obtain a reasonable estimate of harm with the use of information from auto industry surveys. The model can also be used to estimate unjust gains, and it can be applied in other contexts where deceptive claims cause consumers to spend time and effort in the pursuit of a deal before learning that the advertised deal is not actually available.

II. Analysis of Non-Price Effects in a Horizontal Merger

While price effects typically receive the most attention in investigations of proposed mergers, the Horizontal Merger Guidelines recognize that reduced competition can also cause significant losses in consumer welfare through a reduction of non-price benefits to consumers. In the FTC's recent investigation of the proposed merger between DraftKings, Inc. and FanDuel, Ltd., non-price effects were a central part of the Bureau of Economics' analysis.

[3] Details are available at: https://www.ftc.gov/news-events/events-calendar/2018/11/eleventh-annual-federal-trade-commission-microeconomics.

A. The Proposed Transaction

When the merger was proposed in November 2016, DraftKings and FanDuel were the two largest providers of daily fantasy sports (DFS) games with a combined share of more than 95% of DFS revenues (Federal Trade Commission 2017). Although price effects were a primary focus of the investigation, the firms also competed in provision of non-price benefits that significantly affected the value of the product to consumers. In particular, as DFS games gained traction with a large number of consumers only a few years before the proposed merger, DFS firms were still expending significant resources to develop new games and features to attract customers. The Bureau staff found that competition in non-price dimensions was intense and that the provision of these benefits to consumers was likely enhanced, not constrained, by the presence of a meaningful competitor. The Commission voted to block the merger on June 16, 2017, and the parties ultimately abandoned the deal in July 2017.

The primary product of both DraftKings and FanDuel is an internet-based "daily fantasy sports" (DFS) platform where customers can register and enter contests offered on the site.[4] DFS platforms offer customers the opportunity to assemble a roster of professional athletes to compete against other customers to win cash and other prizes.[5] Customers choose a set number of athletes within one professional league to construct their entry's roster and pay an entry fee to enter a contest that is offered by the platform.[6] Similar to the season-long fantasy sports format, in DFS contests the performance of a customer's entry is based on the performance of the roster's athletes over the course of a specified set of real-world games. Unlike traditional season-long fantasy sports, DFS contests are of short duration (typically they are based on the real-world games on one day instead an entire season) and allow customers to compete against hundreds or thousands of other DFS customers (instead of a dozen or fewer opponents in season-long contests).

Because of the short duration of the contests and the ability to include a large number of customers in a single contest, DFS providers can offer a range of game formats, and customers can

[4] At the time of the investigation, paid DFS contests (i.e., contests where entrants pay an entry fee to enter the game with the chance to win cash prizes) were not legal in approximately 10 US states.
[5] While the firms offered free entry contests, our investigation focused on paid contests.
[6] DFS contests are available in all four major North American professional sports leagues (NFL, NBA, MLB, NHL) and a number of other sports (e.g., soccer, golf, NASCAR, mixed martial arts).

enter hundreds of contests over the course of a professional season.[7] The size of the contests vary from head-to-head matchups against one other player to tournament contests that allow for thousands of entries. Likewise, the fees to enter contests range from less than $1 to more than $10,000.

The profitability of DFS platforms depends crucially on their commission rate: the difference between the entry fee that is paid by the customer and the amount of this entry fee that goes towards the pool of prize money to be awarded through the contest.[8] The FTC treated the effective commission rate as the price variable in the investigation. Effective commission rates were generally less than the "nominal" commission rate as the result of both promotional funds offered directly to customers and "overlay" on guaranteed prize pool contests. Overlay represents the shortfall that the platform has to pay when contests close before all of the available entry slots are filled. These unfilled slots mean that the entry fees from contestants may be insufficient to cover the total prize pool that the platform guarantees to pay out. DFS firms frequently use both promotions and overlay to attract customers, which benefits these customers through lower effective commission rates (i.e. lower prices) (Federal Trade Commission 2017 p. 5).

B. Competition

DraftKings and FanDuel engaged in fierce competition for a number of years before their merger agreement.[9] They did not face significant competition from other DFS sites; although the technical barriers to creating a functional DFS product were low, entrants needed a base of hundreds of thousands of users to compete directly with DraftKings and FanDuel. Close to a dozen firms attempted to enter the DFS market, but they uniformly failed to grow their user base to a competitive size. Both the competition between the firms and the investments necessary to build a large user base were best evidenced by DraftKings' and FanDuel's advertising expenditures of hundreds of millions of dollars during the 2015 NFL season (Federal Trade Commission pp. 9-10). NFL broadcasts were saturated with advertising from both firms, as were sports television and

[7] Although the details of the contests vary across different DFS sites, the basics of the games are similar enough that players of one site can successfully play contests on other DFS sites with minimal effort.
[8] The commission rate is analogous to the "house-take" in pari-mutuel betting.
[9] As the DFS market has many characteristics of platform competition, these firms were likely competing for the market" instead of "in the market". The assumption of this model is that there would eventually only be one dominant DFS platform that survives the competitive process.

radio broadcasts. Both DraftKings and FanDuel grew rapidly during this period while their smaller competitors lagged behind.

During this period, the DFS industry received attention from a number of state Attorneys General, who ruled that DFS constituted gambling and was, therefore, illegal. These rulings caused the firms to adjust their growth strategies, which slowed their development of the platforms (Federal Trade Commission 2017 p. 10). A possible benefit from the merger-to-near-monopoly was the ability to increase innovation to grow the DFS market and benefit existing DFS customers.[10] In addition to the standard price effects, the FTC's investigation evaluated a number of non-price benefits that consumers received from using the sites and how the merger would affect these benefits in a but-for world.

The Horizontal Merger Guidelines (US DOJ and FTC, 2010) explicitly consider non-price factors as a way that reduced competition can reduce consumer welfare. Non-price factors are analyzed in a similar way to price effects, although typically these analyses rely more on basic economic intuition of competition and evidence of non-price competition than on formal models.[11] Important sources of competition-driven non-price factors include the quality and variety of existing products, the resources that are expended to improve products, and the provision of complementary services to the product.

Product variety provides clear benefits to consumers by allowing them to find a product-price combination that best satisfies their demand. Variety may be costly for firms to develop, so a reduction in variety that reduces consumer welfare may be profitable for a merged entity. Likewise, the costly provision of complementary services may be reduced due to a merger. In consumer-facing industries, these services frequently take the form of high-quality customer service and/or flexible contract terms. While the specific form and importance of product variety and complementary services vary widely across industries, these factors must be considered in evaluating possible changes to consumer welfare due to a proposed merger.

[10] This argument follows the classic Schumpeterian (1942) argument for monopoly to support innovation investments.
[11] Conceptually, one way to merge the insights of well-developed price-competition models with non-price competition would be to consider a quality-adjusted price. If a merged firm were to reduce the quality of its goods relative to the pre-merger world while keeping its nominal price fixed, this would be equivalent to an increase in the quality-adjusted price.

In the DraftKings/FanDuel case, as well as in many recent cases that have been investigated by the Commission, innovation was the central non-price factor that was considered in the analysis. Competition often spurs firms to invest in innovative research and development activities. This R&D activity can be directed towards either the incremental improvement of existing products or the development of entirely new products that would compete with products that are already in the marketplace. Consumers may benefit from these activities through more product variety, higher quality products, and/or lower prices that are due to lower production costs. Successful innovations can increase a firm's profits -- frequently by allowing it to capture the competitor's customers. Therefore, the presence of competitors can encourage firms to invest more in innovation than they might otherwise, leading to increased consumer welfare. The removal of this competitive pressure through a merger could harm consumers if the merged firm curtails its efforts to develop new products or improve existing ones.[12]

C. Efficiencies Related To Innovation

Similar to the FTC's analysis of merger-specific efficiencies that reduce upward pricing pressure, the agency also considers how merger-specific efficiencies may improve the provision of non-price benefits, such as innovation. As in any evaluation of efficiencies, the claims must be cognizable, merger-specific, and verifiable. In many cases, the FTC must evaluate the possibility that the merged firm will invest more in innovative activities than the sum of two pre-merger companies did. Moreover, the Guidelines specify that a merger that changes the appropriability conditions for firms may spur more innovation by the merged firms. However, the Guidelines also recognize that efficiencies related to innovation are especially difficult to verify (as was the case in this investigation) and may not be sufficient to affect short-term prices. Furthermore, efficiencies are almost never sufficient to justify mergers to near-monopoly, as in the DraftKings/FanDuel case (US DOJ and FTC, 2010 Section 6.4).

As suggested above, the DraftKings/FanDuel merger included significant consideration of the effects of the merger on innovation competition and the provision of complementary services. The potential effect of the merger on the pace of innovation by the merged firm played a central

[12] As in an analysis of price effects from a merger, if one firm's innovations will not take customers from the other party, then a merger of these firms is unlikely to cause a reduction in innovation that will harm consumers.

role in the DraftKings/FanDuel investigation -- primarily as a consequence of the still-evolving nature of the DFS industry. Both firms devoted substantial resources towards the development of new features and services on their respective platforms.

The details of these innovative processes provide important examples of the primary tradeoff, as outlined by the Guidelines, that the Bureau considered when evaluating the net effect of the merger on consumer welfare: The merger could harm consumers through the loss of competitive pressures that would reduce the incentive of the platform to undertake risky investments to develop new products and features. On the other hand, efficiencies in innovation and changes in appropriability could improve innovation incentives and increase the non-price benefits enjoyed by consumers. The evidence around these arguments shows that the merger would have, at best, a mixed effect on innovation and product variety and, ultimately, consumer welfare. Moreover, these efficiencies were not sufficient to overcome the likely harm from a merger to near-monopoly.

The merging parties both had staffs of engineers and developers that were tasked with maintaining and improving the quality of the customer experience on their platforms. The intent of these efforts was to attract and retain players on their sites. One important area of innovation for the firms was the development of new sports offerings (e.g., golf, WNBA) or new platform features (e.g., social interactions) (Federal Trade Commission 2017 pp. 14-15). While adding new sports did not require the overhaul of the existing platforms, each sport required development time and testing to integrate it with the platform. Along with new sports, the firms continuously added new features to attract players. As an example, both firms expanded social interaction options in 2016 with the introduction of “Friends Mode” by FanDuel in and “Leagues” by DraftKings. The intent of these products was to reduce the anonymity of interactions between players on the site and allow players to engage with their friends through the DFS platform.

In addition to improving customer experience and usability, in 2015 and 2016 both firms had devoted significant developer effort towards consumer protection features and “know your customer” (KYC) requirements that are imposed by a number of states on DFS companies.[13] The consumer protection features did little to attract consumers or improve the quality of their

[13] See e.g. https://www.northjersey.com/story/news/new-jersey/2017/08/24/daily-fantasy-sports-taxed-regulated-under-new-law-signed-christie/599021001/

experiences, but they were required for the sites to continue offering contests to customers in these states. These requirements were an obvious potential source of synergies that would result from the merger. These features were duplicative in that they required two separate teams to implement the same features on each site. In addition to the extra regulatory requirements, the growth difficulties encountered by the firms led to a backlog of innovative projects that the firms intended to develop in order to enhance the quality of their sites.

The FTC investigated the possibility that the merger would allow the combined firm to reduce these duplicative efforts and reallocate some of these resources to work on the backlog of innovative projects. While this is a plausible source of efficiencies, the evidence was not necessarily supportive of the possibility. In particular, both firms had maintained a backlog of project ideas since well before the time of the merger. This is not surprising, as both firms were in a "startup" phase and would likely have a list of "to be implemented" projects regardless of the resources that are available to them. Moreover, the magnitude of the resources that would need to be allocated to the most obvious duplicative projects – regulatory and other legally mandated features – was not clear. Specifically, both sites had already developed variety of features that were required by different states by the time of the merger. While continuing compliance monitoring would be necessary, monitoring would require substantially less resources than the initial development of the features. While the firms earlier would have been able to save considerable duplicative effort during this initial phase, there appear to be much less opportunity for efficiencies in the future. Thus, the clear savings opportunities on duplicative efforts seemed to be limited.

Related to the duplication point: The FTC considered the possibility that the larger scale of the merged platform would increase incentives for investment. The nature of software scalability means that the cost of developing a new feature does not increase with the size of the platform; in this environment, combining platforms essentially doubles the return on the investment with little or no additional cost. Thus, a number of projects that would have a negative net present value when the platforms were separate would instead be profitable to implement, which would increase innovation and the benefits to consumers.

However, despite the backlog of projects, there was no evidence of development projects that would be implemented post-merger because of increased scale. Although theory suggests that mergers can benefit innovation through improving returns, without clear evidence on the number

and types of projects that would result only because of the merger, the FTC could not conclude that increased scale would benefit consumers.

The parties also claimed that appropriability of innovations was a substantial impediment to investment that would be solved by the merger. As software-based platforms, DraftKings and FanDuel had little recourse to intellectual property to protect their new designs or features. Both firms had an established history of mimicking successful innovations by their rival (FTC 2017, pp. 14-15) Indeed, this history was a point of evidence on the intense competition between the two firms. As discussed in the previous section, the Guidelines note that the Commission must evaluate the possibility that mergers may improve the abilities of firms to capture the value of their innovations.

While the problem of appropriability of ideas is well understood (indeed, it is the primary justification for intellectual property rights), there is at least one problem with this argument in the current context: Although a feature may be copied, this does not mean that the imitating firm can instantaneously implement the feature. There will be some time period where the innovating firm is the only supplier in the market with the new feature. This time may be sufficient for the innovator to recoup the cost of the investment, despite eventual imitation. Thus, while imitation may be a serious impediment to innovation, the magnitude of its effects is an empirical question.

Our investigation found no direct evidence that the threat of imitation ever caused one of the firms not to pursue a development project. Thus, it was not clear that consumers would benefit from increased appropriability.

D. Cost Efficiencies

The investigation also examined claims as to the cost efficiencies that would result from operating only one platform and eliminating the other. While the agency was unable to verify the details of the cost claims, the elimination of one platform would have an important non-price effect: reducing product variety. While there were only a small number of consummated mergers in DFS prior to this investigation, DraftKings' acquisition of DraftStreet (another DFS provider) in 2014 resulted in the elimination of the DraftStreet platform as the latter's customers were moved to the DraftKings platform. DFS discussion boards and customer interview provided evidence that DraftStreet had a number of superior game features that were not implemented on the DraftKings

site.[14] If the merged entity combined platforms for efficiencies, it was clear that some product variety that was valued by consumers may be lost.

More important, the creation of a single platform would also likely hinder product variety in the medium term. Platforms generally create a streamlined experience for users with a limited set of options to avoid customer confusion. With only one platform, this design principle would necessarily limit the range of options that the site would be able to offer. The parties argued that due to network effects with DFS platforms, the market could support only one dominant provider and this loss of options was inevitable. However, a merger in the early stage of the industry would choke off the potential benefits of one platform's choosing to partner with a firm that is not currently in the DFS market but that could combine complementary assets to create a unique product based on a well-developed DFS platform.[15]

Overall, the presence of two large DFS platforms maintained the option of later product differentiation and experimentation that could benefit DFS customers. As the firms considered adding features outside the standard DFS platform, they would likely benefit from combinations with the owners of complementary assets that could efficiently develop and integrate these features. Two separate platforms allows for the chance of two separate combinations that would have incentives to compete for the market and/or differentiation to serve different segments of the market better. A merger of the two platforms at this early stage of DFS development would foreclose the possibility of consumers' benefitting from these market experiments.

E. Discussion

The DraftKings/FanDuel merger provides an interesting case study of the consideration of non-price effects and the challenges of evaluating claims about them. The interplay of platform economics and innovation was the central non-price effect that was analyzed in this investigation. As the above discussion details, economic theory and the Guidelines suggested a number of potential innovation benefits to consumers from the merger. Clear evidence of these benefits, however, was difficult to find, as it is in many mergers. There was, at best, mixed evidence that

[14] See https://rotogrinders.com/threads/i-miss-draftstreet-1895543.
[15] For instance, DraftKings has announced a partnership with the Arena Football League to livestream games, which is similar to a previous agreement to stream EuroLeague basketball games. See https://www.legalsportsreport.com/19771/draftkings-partners-with-arena-football-league/.

innovation would increase post-merger. Moreover, maintaining competition in the marketplace meant that incentives for product differentiation and the possibility of productive combinations with other, non-DFS entities was preserved.

Most important, as the Guidelines note, merger to near-monopoly is almost never justified by innovation benefits. This merger was no exception.

III. Consumer Injury from Deceptive Automobile Dealer Ads

In the past several years, the FTC has brought dozens of enforcement actions against deceptive advertising by automobile dealers, including cases in two large-scale sweeps -- Operation Steer Clear in 2014, and Operation Ruse Control in 2015 -- and many other cases.[16] These actions have addressed a variety of claims that have appeared in dealers' ads that entice consumers to pursue a purchase with the dealer, but that misrepresent the deals that are actually offered or fail to disclose limiting conditions of those deals. For example, a television ad may tout a low monthly payment for the featured vehicle, but fail to make clear that the offer requires a large down payment, that it is available only to recent college graduates or military veterans, or that the low payments apply only for the first 12 months of the loan, after which they balloon.

Deceptive ads about automobile sales and financing differ from some other types of deceptive claims in the marketplace because the true terms and conditions of the offer would typically be revealed to the consumer at some point before a purchase is finalized, so the deception does not persist through the sale.[17] Hence, the injury to consumers cannot be captured by analyzing the effect of the deception on demand and prices, as in more standard deceptive advertising cases.[18] Nevertheless, these ads injure consumers by persuading them to spend time and effort to visit the dealership, when they might otherwise have pursued a legitimate offer elsewhere. In this section, we

[16] See sweep press releases at https://www.ftc.gov/news-events/press-releases/2014/ 01/ftc-announces-sweep-against-10-auto-dealers and https://www.ftc.gov/news-events/ press-releases/2015/03/ftc-multiple-law-enforcement-partners-announce-crackdown, and a list of press releases for other actions at https://www.ftc.gov/news-events/media-resources/consumer-finance/auto-marketplace.

[17] This may not be true for certain types of deceptive claims in the auto sector, such as manufacturer claims about environmental or fuel economy features of a vehicle, or when a dealer deceptively advertises that it will pay off outstanding debt on a trade-in, but in fact rolls this debt into the consumer's new loan. In such cases, consumers may not discover the deception before completing a purchase.

[18] The effect of deceptive advertising on demand in cases where the deception persists through the sale has been studied by Peltzman (1981) and Rao and Wang (2017).

develop a simple conceptual model of how deceptive auto ads injure consumers and how the model can be used to quantify this injury, even when case-specific data are very limited.

The concept that is explored in this section is rooted in the literature on consumers' value of time, which dates back to Becker (1965) and Gronau (1980), as well as the standard search theory of Stigler (1961) and more stylized search models such as Lee (1994) and Chatterjee and Lee (1998). Wernerfelt (1994), Lazear (1995), and Anderson and Renault (2006) consider the firm's marketing strategy when consumers must incur a sunk cost before purchasing in a one-shot model without repeat purchases, like the model in this section. The model most closely related to this one is Lazear's, which shows that there is a fully rational equilibrium with bait-and-switch deceptive advertising. Whether bait-and-switch marketing can benefit consumers by giving sellers the opportunity to demonstrate new products has been debated by Gerstner and Hess (1990), Hess and Gerstner (1998), and Wilkie et al. (1998). Other recent theory by Piccolo et al. (2015, 2017) and Rhodes and Wilson (2018) considers when firms advertise deceptively with rational consumers and the effects of deceptive advertising policy in static models of consumer welfare.

Search behavior and transaction costs of consumers in automobile markets have also been studied empirically. Zettelmeyer et al. (2006) and Morton et al. (2011) combine consumer surveys with transaction data to study how consumer search costs and bargaining disutility affect prices, and find that consumers who search more or like bargaining more pay less. Schiraldi (2011), Gavazza et al. (2014), and Moraga-Gonzalez et al. (2015) have used structural demand estimation to measure the transaction costs that are involved in car shopping; they find that these costs have a significant influence on vehicle pricing and the size of the markets for new and used cars. In addition, estimates of the value of consumers' non-work time -- which have been surveyed by Small and Verhoef (2007) and Zamparini and Reggiani (2007) -- are a frequent topic in the transportation literature.

The conceptual model in this section provides a framework for quantifying the harm that is caused by deceptive auto ads that entice consumers to spend time and effort to visit the dealer, only to find out that the terms that were claimed in the ads are not actually available. This leads consumers to either: a) turn away without purchasing, having wasted time and effort; or b) purchase, and possibly pay a price premium that is bounded by the expected cost of the additional time and effort

that is needed to pursue the best available alternative (which would have been the first choice in the absence of the deceptive claims).

With the limited data that may be available in a particular case on the prevalence of deceptive ads and the number of consumers reached, among other things, this framework can be used to quantify in dollars an estimate -- or a range of estimates -- of the consumer injury from the deception. The framework can similarly be used to estimate the dealer's gains from the deception given data on dealer profits. This approach also has applications in in other contexts where deceptive claims cause consumers to spend time and effort pursuing a deal, but the deception is revealed to consumers prior to actually making a purchase.

A. Model of Consumer Injury

Consider a model in which car dealer *A* runs deceptive ads. All consumers either buy from dealer *A* or from their next best alternative, *B*, which can vary by consumer.[19]

1. Model Setup

All consumers receive a constant consumption utility, u_A, from dealer *A*'s good. Dealer *A* deceptively advertises price p_A^D for good *A*, so that before visiting dealer *A*, a deceived consumer's expected utility from purchasing good *A* is $E(U_A) = u_A - p_A^D$. However, when a consumer visits dealer *A*, it is revealed that he actually charges price p_A^T for it, where $p_A^T > p_A^D$ holds. Consumers incur cost *c* for each dealer visit, which represents the time and nuisance that are involved in engaging with the dealer up to the point when the truly available terms are revealed.

There is a continuum of consumers, $[\underline{\theta}, \bar{\theta}]$, who vary by their expected utility of the next best alternative, $E(U_B(\theta)) = u_B(\theta) - p_B^T(\theta)$, where $u_B(\theta)$ and $p_B^T(\theta)$ are the consumption utility and price of consumer θ's next-best alternative, respectively, and $\partial E(U_B(\theta))/\partial\theta > 0$ holds.[20] We interpret this next-best alternative as a second dealer, *B*, which may differ by consumer, but it

[19] This model implicitly assumes that the consumer has already made the decision to buy a car from somewhere, and that affordable options are available so that she will not opt out or defer the purchase. This assumption seems reasonably to describe the typical car shopper; but the model can also be adapted if a dealer's claims seem particularly attractive to consumers who otherwise would not purchase a vehicle.

[20] Assuming that consumers have the same value for *A* and different values for *B* is equivalent to a Hotelling model where consumers have different values for both products.

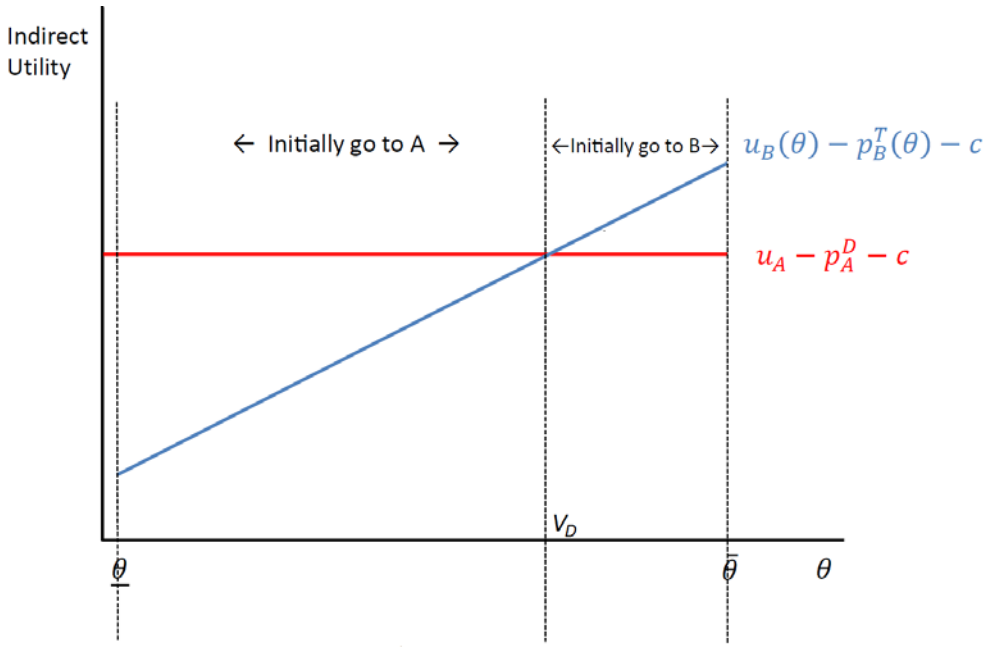
could also be a private-party seller. We assume that dealer *B* truthfully advertises the price of good *B*, $p_B^T(\theta)$, and that the consumption utility of each good is known to each consumer ex ante.[21]

2. Consumer Decisions

A deceived consumer chooses to visit dealer A initially if and only if $u_A - p_A^D - c \geq u_B(\theta) - p_B^T(\theta) - c$ holds; otherwise, she visits dealer B. Let V_D denote the number of consumers who choose to visit dealer *A* initially given the deception, such that $E(U_B(V_D)) = u_B(V_D) - p_B^T(V_D) = u_A - p_A^D$ holds.

This initial decision is shown in Figure 1.

Figure 1: The Consumer's Initial Dealer Visit



The deceived consumer visits dealer *A* with the intention of purchasing good *A* for price p_A^D. However, once the consumer has paid cost *c* to make this visit, she learns that the price actually charged by dealer *A* is $p_A^T > p_A^D$. Now she must make a decision: leave dealer *A* and visit dealer *B*

[21] Alternatively, assuming that the next-best alternative seller also advertises deceptively with positive probability would change the results on consumer injury through the effects of dealer *A*'s deception on consumer utility, and through consumers' beliefs about the available deals. For the purposes of this applied analysis, we consider only the simple case where dealer *A* deceives and its competitors do not.

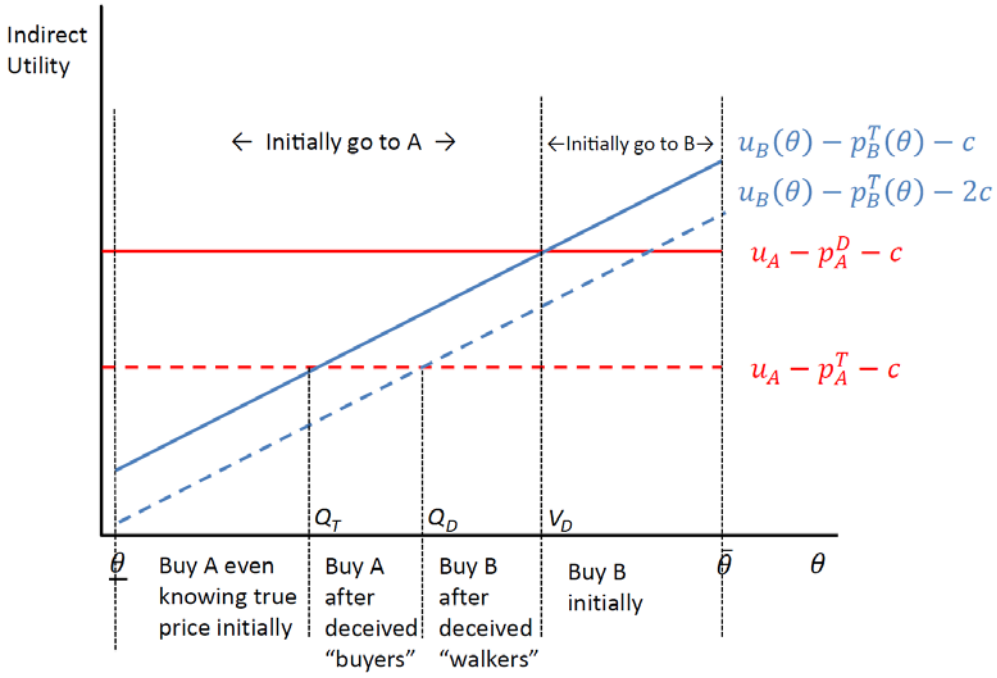
("walk"), thereby incurring additional cost c in order to pay $p_B^T(\theta)$ for good B; or buy from dealer A and pay p_A^T for good A. Let Q_D denote the number of consumers who buy from dealer A after the deception is revealed; and let Q_T denote the number of consumers who would have bought from dealer A in the absence of deceptive ads.

The consumer's decision after realizing the deception is shown in Figure 2.

When the deception is revealed, the cost to the consumer of the initial dealer visit is now sunk, which creates a sales advantage for dealer A. At this point, if the expected utility of making another dealer visit and purchasing good B ($u_B(\theta) - p_B^T(\theta) - c$) is greater than the expected utility of purchasing good A at the true price, but without an additional visit ($u_A - p_A^T$), then the consumer leaves dealer A and purchases from dealer B. Otherwise, the consumer purchases good A despite the deception. This means that Q_D is defined by the equation

$E(U_B(Q_D)) = u_B(Q_D) - p_B^T(Q_D) = u_A - p_A^T + c$.

Figure 2: The Deception is Revealed: Walk or Buy?

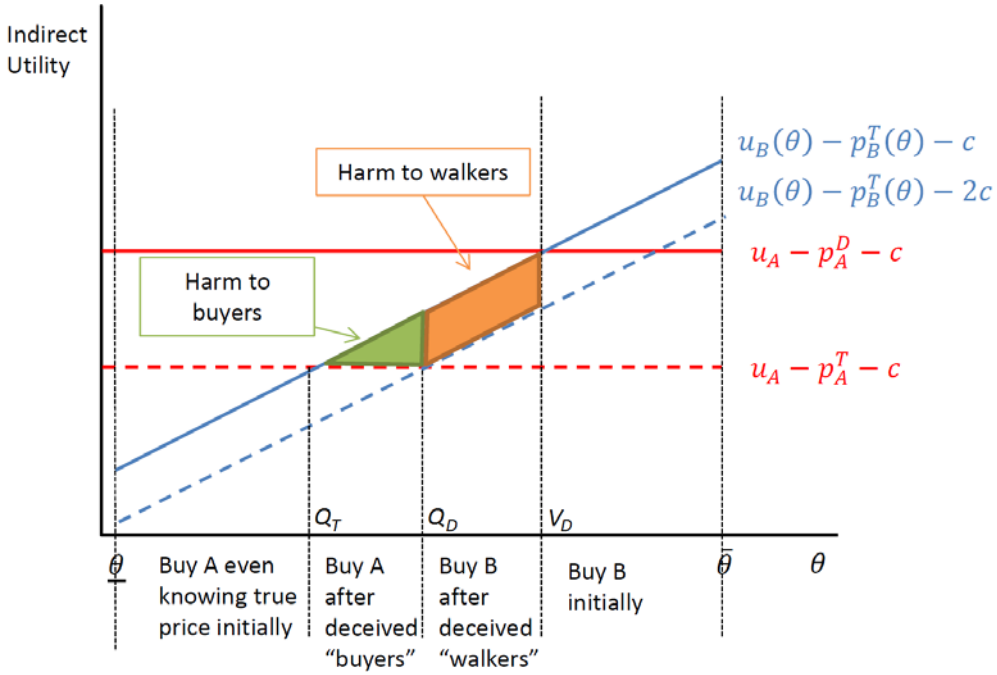


For consumers who walk after the deception is revealed ($u_B(\theta) - p_B^T(\theta) - c > u_A - p_A^T$),

total utility from the transaction is $u_B(\theta) - p_B^T(\theta) - 2c$, while the counterfactual utility with no deception would have been $u_B(\theta) - p_B^T(\theta) - c$. The harm to these consumers is therefore the cost of an additional dealer visit, c, that would not have occurred absent the deception. Let the total harm to walkers be denoted by I_{walk} and defined by $I_{walk} = c(V_D - Q_D)$.

For consumers who buy from dealer A after the deception is revealed ($u_B(\theta) - p_B^T(\theta) - c \leq u_A - p_A^T$), utility from the transaction is $u_A - p_A^T - c$. Their counterfactual utility depends on which dealer they would have visited absent the deception. If $u_B(\theta) - p_B^T(\theta) \leq u_A - p_A^T$ holds, then the consumer would have purchased from dealer A absent the deception with counterfactual utility $u_A - p_A^T - c$, so there is no consumer injury. The number of consumers in this group, Q_T, is defined by the equation $E(U_B(Q_T)) = u_B(Q_T) - p_B^T(Q_T) = u_A - p_A^T$.

Figure 3: Consumer Injury



If $u_B(\theta) - p_B^T(\theta) > u_A - p_A^T$ holds, then the consumer would have purchased from dealer B absent the deception, with counterfactual utility $u_B(\theta) - p_B^T(\theta) - c$. The harm to these consumers is therefore equal to $u_B(\theta) - u_A - p_B^T(\theta) + p_A^T$, where $0 < u_B(\theta) - u_A - p_B^T(\theta) + p_A^T \leq c$ holds. Lacking any information on the distribution of θ, we assume that $u_B(\theta) - p_B^T(\theta)$ is linear in θ so that the

average consumer injury to this group is $\frac{c}{2}$.[22] Let the total harm to walkers be denoted by I_{buy}. It follows from the above assumptions that $I_{buy} = \frac{c}{2}(Q_D - Q_T)$ holds.

Consumer injury from the deception is shown in Figure 3.

To summarize, the model yields the following results: The harm to deceived consumers who visit without purchasing is *c*; and the average harm to deceived consumers who purchase from dealer *A* but would not have done so absent the deception is *c*/2. This means that the total consumer injury, denoted by I_{total}, is given by the following equation under the assumptions described above:

$$I_{total} = I_{walk} + I_{buy} = c(V_D - Q_D) + \frac{c}{2}(Q_D - Q_T). \quad (1)$$

Therefore, in order to estimate the total consumer injury from the deception, one needs only to estimate: 1) the number of deceived consumers who walk; 2) the number of deceived consumers who purchase from dealer *A* but would not have done so absent the deception; and 3) the value of *c*.[23] In the following section, we explain how case-specific data and industry statistics can be used to obtain a reasonable estimate of these components, and in turn, an estimate of the consumer injury that is caused by the deceptive ads.

3. Comparative Statics

The simple model above yields some notable comparative statics: First, consider how consumer injury depends on the consumer's time and nuisance cost, *c*. Trivially, total injury is increasing in *c* ($\partial I_{total}/\partial c > 0$), but we also have the results below, which follow directly from the above definitions of $E(U_B(V_D))$, $E(U_B(Q_D))$ and $E(U_B(Q_T))$ and the assumption that $\partial E(U_B(\theta))/\partial\theta > 0$ holds: $\partial V_D/\partial c = 0$; $\partial Q_D/\partial c > 0$; and $\partial Q_T/\partial c = 0$. Together, these results show that as the time and nuisance cost of the dealer visit increase, the number of deceived consumers remains constant, but the number of deceived buyers ($Q_D - Q_T$) increases and the number of deceived walkers ($V_D -$

[22] This assumption follows the intuition that consumers in this group will buy only if there is no price premium or a relatively small one, while consumers faced with a significant price premium compared to the next best alternative will leave. We also assume that willingness-to-pay for good *A* is fixed, and does not increase due to an endowment effect or learning about the good during the dealer visit. Finally, we assume that there is no other dealer misconduct and that the deception is resolved before the sale is completed.

[23] An additional indirect channel of consumer injury is that deceptive ads pollute the market with bad information, which decreases the credibility of advertising claims in general and increases consumer search costs and uncertainty. The marginal indirect effect is likely small in a given case, but the cumulative effect across cases may be large.

Q_D) decreases. As the cost of an additional dealer visit increases, more of the deceived consumers buy from dealer *A*, and the average injury to both deceived buyers and walkers increases.

A second comparative static result worth noting is the effect of the degree to which the deceptive ads misrepresent the true price, or the effect of the dealer *A*'s deceptive price, p_A^D, holding constant the true price, p_A^T. Based on the above definitions of $E(U_B(V_D))$, $E(U_B(Q_D))$ and $E(U_B(Q_T))$, and the assumption that $\partial E(U_B(\theta))/\partial\theta > 0$ holds, we have the following results: $\partial V_D/\partial p_A^D > 0$; $\partial Q_D/\partial p_A^D = 0$; and $\partial Q_T/\partial p_A^D = 0$. This means that an increase in the extent to which the deceptive ads misrepresent the true price causes the number of deceived walkers ($V_D - Q_D$) to increase, but the number of deceived buyers ($Q_D - Q_T$) remains constant. Because the number of walkers increases, total consumer injury also increases with the extent of the misrepresentation ($\partial I_{total}/\partial p_A^D > 0$).

In the applications considered in this paper, we do not attempt to quantify the degree of misrepresentations because the financial complexity of vehicle purchases and the variation in alternatives and actual purchase terms across consumers make this difficult to measure. However, this result is noteworthy because it suggests that, aside from law compliance, there are reasons for a dealer to limit the degree of deception: More egregious misrepresentations may attract more consumer visits without necessarily increasing sales.

B. Applying the Model

The simple model above provides a framework for quantifying the harm to consumers who were persuaded by a deceptive ad to visit the dealership. In practice, this model does not apply to all consumers because some consumers will visit the dealer for reasons other than advertising -- e.g., location, past experience -- and some consumers may be responding to truthful advertising by the same dealer. In this section, we discuss the data that can be used to form reasonable estimates of how many consumers were persuaded by a deceptive ad to visit the dealership, as well as the harm per consumer. The advantage of this framework is that it can be readily applied even in cases with severe data limitations by using results from industry-wide consumer surveys as proxies for missing data.

In most applications, the dealer's sales and lease totals are either known or possible to approximate.[24] The number of consumers who visited the dealer without purchasing is more difficult to measure, though data on this may be available in some cases. For example, some dealers collect consumer contact information at the beginning of the dealer visit, before the consumer has decided whether to purchase. In the absence of such data, industry surveys that report the number of dealers that consumers visit before making a purchase can be used to infer the typical number of non-purchasing visitors that dealers receive for each consumer who makes a purchase.

In practice, non-purchasing consumer visits occur for many reasons other than deceptive ads, but these are not captured by the simple conceptual model in this paper. Let the number of non-purchasing visits that are not due to deception be denoted by γ. Suppose that both the total number of sales or leases, Q_D, and the total number of non-purchasing consumer visits, $\gamma + V_D - Q_D$, are known. How many of the dealer's sales and non-purchasing visits were caused by the deceptive ads? The two key factors to answering this question are: 1) how many consumers were persuaded to visit the dealer by ads; and 2) how many of the dealer's ads were deceptive?

The number or proportion of consumers who were persuaded to visit the dealer by ads can be estimated using marketing studies or customer satisfaction surveys that are conducted by the dealer, if available. Alternatively, one can find information that is useful as a proxy in surveys of U.S. auto consumers such as J.D. Power's New Autoshopper Study and AutoTrader's Automotive Buyer Influence Study. For example, J.D. Power (2011) asked respondents what influenced their decision to visit the dealership where they made a purchase; 22% responded internet ads; 9% responded newspaper ads; and 8% responded radio or TV ads.[25]

If a particular dealer's advertising intensity in certain ad media differs from the average dealer, then these responses can be weighted by the ratio of the dealer's ad expenditures in each medium to the industry average expenditures reported in industry publications, normalized by sales volume. Also, because these responses reflect the industry average influence of various sources, they may underestimate the true consumer influence of deceptive ads if such ads are more likely to

[24] Industry trade publications often publish dealer rankings by sales volume and include annual sales totals in the rankings.

[25] The distribution of responses to such questions has shifted towards online ads and away from other media over time, so it is best to use results from surveys that were conducted during the same time period when the deceptive ads were in circulation.

be influential than non-deceptive ads. However, these percentages also may overestimate the true proportion of consumers whom deceptive ads caused to visit the dealer, since some of those consumers might have visited the dealer even in the absence of the deceptive claims.

In practice, a dealer may have circulated some ads with legitimate offers, or strictly persuasive ads with no direct information about sale terms, along with deceptive ads about available deals. If this is the case, it is necessary to estimate the proportion of ad-influenced consumers who were influenced to visit the dealer by deceptive ads. This can be done by examining a random sample of the dealer's ads and determining the proportion of those ads that are deceptive. Of course, some ads receive a larger audience than others, so if data on audience size is available -- e.g., the number of consumer exposures or the cost of the ads -- the sample can be stratified, or sample statistics can be weighted by the measure of consumer exposure. The result is an estimate of the probability that a single randomly drawn consumer exposure to the dealer's advertising will involve a deceptive ad rather than a legitimate one.

This probability of viewing a deceptive ad in a given exposure is likely an underestimate of the proportion of ad-influenced consumers who were influenced by a deceptive ad for two reasons: First, because deceptive ads are designed to be more persuasive than legitimate ones, for many consumers exposure to a deceptive ad is more likely to influence them than is exposure to a legitimate ad. Second, many consumers will be exposed to a dealer's ads multiple times, but it takes only one exposure to a deceptive ad to mislead the consumer.

How can one account for these considerations quantitatively? Under a few reasonable assumptions, we derive a simple probability model that adjusts the probability of viewing a deceptive ad upward to account for them:[26]

Assume that for each consumer the probability of N ad exposures is declining in N, such that the fraction of consumers viewing N of the dealer's ads is equal to $1/2^N$. Let q denote the probability that an ad that is drawn randomly with replacement and exposed to the consumer is deceptive. It follows that the probability of viewing at least one deceptive ad in N exposures is equal to $1-(1-q)^N$. Finally, assume that consumers who are exposed to at least one deceptive ad

[26] The simple probability model that follows amounts to an assumed probability distribution of ads received by a given consumer. It is similar to a simplified version of a Butters (1977) model, where firm choices about the number of ads circulated and the prices that are advertised in those ads are exogenously given, rather than endogenous as they are in that paper.

are deceived. This assumption will lead to an overestimate if some of these consumers would also have been persuaded by a legitimate ad. However, the assumption is a simple way to reflect the likelihood that deceptive ads would be more persuasive than legitimate ones. Additionally, the assumed distribution of ad views is conservative in that half of consumers view only one ad, another quarter see only two ads, etc., so that most consumers are assumed to have few chances to see a deceptive ad. It follows from these assumptions that the proportion of deceived consumers is equal to $\sum_{N=1}^{\infty}\left(\frac{1}{2^N}\right)(1-(1\ -\ \mathrm{q})^N) = 1 - \frac{1-\mathrm{q}}{1+\mathrm{q}}$.

The final component that is needed to calculate an estimate of consumer injury is the value of the time and nuisance cost, *c*. This is not a search cost per se, but instead represents the cost of a physical visit to the dealer up to the point of finalizing the purchase; this assumes that consumers have already searched and identified the two dealers where they are most likely to make a purchase (including the deceptive dealer). This is a mild assumption in the auto market, where the average consumer spends 8-12 hours searching online before making a purchase, according to recent AutoTrader (2015, 2016) consumer surveys. One way to estimate this cost would be to multiply the amount of time that the average consumer spends on a dealer visit up to the point of purchase by a measure of the value of the consumer's time such as the mean wage rate in the dealer's state or MSA -- possibly adjusted to reflect the value of this specific non-work activity.

Empirical literature on the value of consumers' time suggests that non-work time tends to be valued at a discount of the gross wage rate. Most studies of the value of non-work time use either stated-preference survey data or revealed preference choice data on travel time. According to Small and Verhoef (2007), the discount factor that is estimated in such studies varies widely depending on the circumstances, which can include commuting or leisure travel, with estimates ranging from approximately 20% to 90% of the gross wage rate. A meta-analysis of this value of transportation time estimates for U.S. citizens by Zamparini and Reggiani (2007) finds that the value ranges from 13% to 145% of the gross wage rate, with a mean of 53%, for studies that were conducted in the U.S. A novel approach by Wolff (2014), who analyzes speeding behavior as a function of gas prices, finds discount factors ranging from 45% to 63%, which is consistent with more traditional approaches.

One reason for the wide range of value of time estimates is that higher discount factors can apply in contexts of relatively high stress or nuisance to the consumer. For example, Small et al. (2005) estimate a discount factor of 93% of the average wage rate using data on commuting time costs of greater Los Angeles long-distance commuters. The haggling involved in a typical dealership visit is likely a greater nuisance to many consumers than other non-work, such as the average commute or leisure travel. For this reason, and because many families do car shopping jointly, which absorbs multiple consumers' time, it seems reasonable to use the undiscounted wage rate in this context.

Consumer surveys by J.D. Power (2011) and AutoTrader (2016) find that consumers spend an average of about two hours looking at vehicles and negotiating before signing paperwork to complete a purchase, which is a reasonable proxy for the amount of time that consumers would spend on a dealer visit before learning that the deceptive claims made in an advertisement are not actually available to them. While the deception may be realized earlier in the process by some consumers, other consumers may not realize it until later, in the paperwork-signing stage. This also does not account for time traveling to an additional dealership, though in many cases that would be minimal due to the tendency of competing auto dealers to cluster in the same area.

The above components can be combined to calculate an estimate of the total consumer injury that is caused by the deception. Let the probability of viewing a deceptive ad in medium i be denoted by q_i, with the proportion of consumers influenced by ad medium i denoted by r_i. Let e_i and E_i denote the dealer's ad expenditure and the industry average ad expenditure on medium i, respectively. For simplicity, assume that $Q_D/V_D = Q_T/(Q_T + \gamma)$ holds: The probability of purchase given deception is equal to the probability of purchase given no deception.[27] The above components can then be applied to both the number of sales or leases by the dealer, Q_D, and the number of non-purchasing consumer visits, $\gamma + V_D - Q_D$, to arrive at an estimate of the number of consumers in each category who were injured by the deception, $Q_D - Q_T$ and $V_D - Q_D$, respectively. When we combine this with the estimated injury per consumer, the estimated total consumer injury caused by the deception is given by the following equation:

[27] If instead the probability of purchase given deception were less than the probability of purchase given no deception, total consumer injury would be underestimated. This is because the proportion of deceived consumers among non-purchasing visitors would be underestimated and the proportion among purchasing consumers would be overestimated, with a larger per-consumer injury estimate in the former category.

$$Injury = (c(\gamma + V_D - Q_D) + \frac{c}{2} Q_D) \sum_i r_i \frac{e_i}{E_i} (1 - \frac{1 - q_i}{1 + q_i}) \quad . \quad (2)$$

a. Unjust Gains

As an alternative to redress of consumer injury, consumer protection law also sometimes allows disgorgement of "unjust gains", which are usually interpreted in economic terms as the profits that are earned due to the law violation.[28] The framework above can also be used to estimate total unjust gains from deceptive auto ads given data on the dealer's profits per sale, π. Assuming that the deception increases the dealer's sales but does not affect its profit per sale, one can estimate unjust gains by multiplying the dealer's total sales and our estimated proportion of sales made due to the deceptive ads by the dealer's profit per sale, as follows:

$$Gains = \pi Q_D \sum_i r_i \frac{e_i}{E_i} (1 - \frac{1 - q_i}{1 + q_i}) \quad (3)$$

b. Hypothetical Example

Consider a hypothetical case where an auto dealer publishes deceptive newspaper and online banner ads for two years. All of the dealer's newspaper ads contain deceptive claims (q_N = 1), while only half of its online ads are deceptive (q_O = 0.5). The dealer sells 20,000 vehicles during the two years when the ads circulated (Q_D = 20,000), and for every purchase, three other consumers visited the dealer without purchasing ($\gamma + V_D - Q_D$ = 60,000). Suppose that the mean wage rate in the local market is $25 per hour ($c$ = $50 for two hours), and that the dealer earns an average of $200 in profit per vehicle sold (π = $200).

The above information can be combined with results from J.D. Power (2011), which found that 9% of surveyed consumers visited the dealer from which they purchased due to newspaper ads (r_N = 0.09), while 22% did so due to online ads (r_O = 0.22). For simplicity of the example, assume that this dealer's advertising expenditures in each ad medium is equal to the industry average by sales volume ($e_N/E_N = e_O/E_O = 1$). This leads to an estimate that approximately 23.67% of the dealer's consumers were injured by its deceptive ads.

Inserting these components into Equation (2), we calculate an estimate of approximately $828,333 in total consumer injury that was caused by the deceptive ads; this includes $710,000 in

[28] In some legal cases, courts have interpreted unjust gains as gross revenue rather than profits.

harm to non-purchasing consumers and $118,333 in harm to purchasing consumers. Using Equation (3), we also calculate an estimate of approximately $946,667 in unjust gains that were caused by the deceptive ads.

Of course, a single point estimate is far too precise a number given all of the assumptions that are involved in this approach, and one can build in as much uncertainty as seems appropriate to the various components to reach instead upper and lower bounds for injury and gains. The above hypothetical calculation simply serves to demonstrate the approach.

C. Discussion

The model that is described in this article provides a way to conceptualize and quantify in dollars the harm to consumers that is caused by deceptive advertising by auto dealers. Even in cases where the available case-specific data are very limited, the model can be used to obtain a reasonable estimate of injury, or a range of estimates, by using industry-wide survey results as proxies for missing data. The advantage of this approach compared to other more sophisticated theoretical or empirical models is that it involves relatively few parameters, and those that it does include can be calibrated using data that are often collected in the normal course of business, or by industry trade publications.

In addition to deceptive auto ads, this approach can also be applied in other contexts where deceptive ads cause consumers to spend time and effort pursuing the advertised deal, but the deception is revealed to consumers prior to actually making a purchase. Examples include deceptive real estate and mortgage ads, or other types of deceptive offers that entice consumers to visit a brick-and-mortar store or complete a time-consuming application before learning the terms of purchase actually available.

IV. Conclusion

As this article demonstrates, FTC economists must confront a variety of challenging problems when performing their duty to provide the Commission with economic analysis to help inform the decision-making process. At times, careful application of more or less off-the-shelf economic models may represent the best approach. The analyses presented here, on the other hand,

reflect situations where FTC economists had to tailor their analysis in order to address the issues at hand.

V. References

Anderson, S. P. & Renault, R. (2006). Advertising Content. American Economic Review, 96(1), 93-113.

AutoTrader. (2015). 2015 Automotive Buyer Influence Study: Sources that Influence Purchase. Atlanta, GA: Autotrader Inc.

AutoTrader. (2016). 2016 Car Buyer Journey. Atlanta, GA: Cox Automotive.

Becker, G. (1965). A Theory of the Allocation of Time. The Economic Journal, 75(299), 493-517.

Butters, G. R. (1977). Equilibrium Distributions of Sales and Advertising Prices. The Review of Economic Studies, 44(3), 465-491.

Chatterjee, K. & Lee, C. C. (1998). Bargaining and Search with Incomplete Information about Outside Options. Games and Economic Behavior, 22(2), 203- 237.

Federal Trade Commission. (2017). Complaint in the Matter of DraftKings, Inc. and FanDuel Ltd.

Federal Trade Commission (2018). Stats and Data 2017. Retrieved September 18, 2018, from https://www.ftc.gov/reports/annual-highlights-2017/stats-and-data.

Gavazza, A., Lizzeri, A. & Roketskiy, N. (2014). A Quantitative Analysis of the Used-Car Market. The American Economic Review, 104(11), 3668- 3700.

Gerstner, E. & Hess J. D. (1990). Can Bait and Switch Benefit Consumers? Marketing Science, 9(2), 114-124.

Gronau, R. (1980). Home Production–A Forgotten Industry. The Review of Economics and Statistics, 62(3), 408-416.

Hess, J. D. & Gerstner, E. (1998). Yes, Bait and Switch Really Benefits Consumers. Marketing Science, 17(3), 283-289.

J.D. Power and Associates. (2011). Online Auto Shoppers: Who Are They and How Do You Meet Their Needs? Costa Mesa, CA: J.D. Power and Associates, The McGraw-Hill Companies, Inc.

Lazear, E. P. (1995). Bait and Switch. Journal of Political Economy, 103(4), 813-830.

Lee, C. C. (1994). Bargaining and Search with Recall: A Two-Period Model with Complete Information. Operations Research, 42(6), 1100-1109.

Moraga-Gonzlez, J. L., Sandor, Z. & Wildenbeest, M. R. (2015). Consumer Search and Prices in the Automobile Market. Working paper.

Morton, F. S., Silva-Risso, J. & Zettelmeyer, F. (2011). What Matters in a Price Negotiation: Evidence from the US Auto Retailing Industry. Quantitative Marketing and Economics, 9(4), 365-402.

Peltzman, Sam. (1981). The Effects of FTC Advertising Regulation. The Journal of Law & Economics, 24(3), 403-448.

Piccolo, S., Tedeschi, P. & Ursino, G. (2015). How limiting deceptive practices harms consumers. The RAND Journal of Economics, 46(3), 611-624.

Piccolo, S., Tedeschi, P. & Ursino, G. (2017). Deceptive Advertising with Rational Buyers. Management Science, 64(3), 983-1476.

Rao, A. & Wang, E. (2017). Demand for 'Healthy' Products: False Claims and FTC Regulation. Journal of Marketing Research, 54(6), 968-989.

Rhodes, A. & Wilson, C. (2018). False Advertising. The RAND Journal of Economics, 49(2), 348-369.

Schiraldi, P. (2011). Automobile Replacement: A Dynamic Structural Approach. The RAND Journal of Economics, 42(2), 266-291.

Schumpeter, J. (1942). Capitalism, Socialism, and Democracy. New York: Harper and Row.

Small, K. A., & Verhoef, E. T. (2007). The Economics of Urban Transportation. Routledge, New York.

Small, K. A., Winston, C. & Yan, J. (2005). Uncovering the Distribution of Motorists' Preferences for Travel Time and Reliability. Econometrica, 73(4), 1367-1382.

Stigler, G. J. (1961). The Economics of Information. Journal of Political Economy, 69(3), 213-225.

U.S. Department of Justice and the Federal Trade Commission. (2010). Horizontal Merger Guidelines.

Wernerfelt, B. (1994). Selling Formats for Search Goods. Marketing Science, 13(3), 298-309.

Wilkie, W. L., Mela, C. F. & Gundlach G. T. (1998). Does Bait and Switch Really Benefit Consumers? Marketing Science, 17(3), 273-282.

Wolff, H. (2014). Value of Time: Speeding Behavior and Gasoline Prices. Journal of Environmental Economics and Management, 67, 71-88.

Zamparini, L. & Reggiani, A. (2007), Meta-Analysis and the Value of Travel Time Savings: A Transatlantic Perspective in Passenger Transport. Networks & Spatial Economics, 7, 377-396.

Zettelmeyer, F., Morton, F. S. & Silva-Risso, J. (2006). How the Internet Lowers Prices: Evidence from Matched Survey and Automobile Transaction Data. Journal of Marketing Research, 43(2), 168-181.