<u>Pricing in the Age of AI: Ethical Challenges of Algorithm-based Pricing</u>

Algorithm-based pricing is becoming increasingly popular (Bertini and Koenigsberg, 2021). In principle, it involves the practice of setting prices based on the forces of supply and demand. As such, its profit-maximization intent should translate into company profits without necessarily endangering consumer welfare. However, in practice, it can have several downstream consequences that are potentially harmful for consumers, and thus poses profound ethical dilemmas (Federal Trade Commission, 2014; Martin, 2019; Tanner, 2014). This project will focus on identifying some of the most prominent ethical issues associated with algorithm-based pricing, and how marketers can address these issues for long term firm success and consumer welfare.

Existing research on algorithm-based pricing has three main streams of consumer-welfare related concerns: (a) predatory differential pricing, (b) price gouging during crises, and (c) price transparency. We briefly outline each of these over the next few sections.

First, the White House (White House Archives, 2015) published a report highlighting the potential pitfalls related to the practice of differential pricing using big data. Differential pricing is widely considered to become the pre-eminent pricing method for most businesses in the near future (Bar-Gill, 2019). It focuses on calibrating product prices to resonate with the forces of supply and demand - often with little or no consideration to potential inequities. For example, an infamous recent case involved setting of the price of an essential, life-saving drug (EpiPen) by the pharmaceutical company Mylan (Lupkin, 2019). The company increased the price of the drug from $13.5 to $300 – mainly due to consumers' need for the drug. This definitely did not consider the needs of consumers with special medical conditions. In fact, research suggested $24 as the maximum price for the drug basis a value-based pricing analysis (Shaker and Greenhawt, 2018). Regardless, predatory differential pricing dictated Mylan to set an exorbitant price. Similarly, ride sharing companies, such as Uber, have been much maligned by consumers due to practices such as surge pricing (Leber, 2015; Pringle, 2019) – which often charge consumers a substantial premium for the same service that is regularly priced much lower. Another example of such ethically-problematic application of differential pricing is the practice of gender-based price surcharges (popularly termed as the pink tax). As outlined in a report published by the New York City Department of Consumer Affairs (NYDCA, 2015), this involves charging significantly higher prices for female (vs. male) versions of the same product. Such practices have been widely criticized by lawmakers from both sides of the political spectrum – with legislations being instituted in some states (California House, 2021; Ohio House, 2020). These are only a few, but illustrative, examples of how algorithm-based, predatory differential pricing may have downstream consequences that are not in the best interest of consumers. Marketers need to identify how to ensure pricing algorithms do not prioritize short term profits over long term firm success.

The second ethical dilemma posed by algorithm-based pricing involves the practice of price gouging during times of crises. As evidenced by the recent case of utility company pricing when winter storm Uri hit Texas (Bryce, 2021), algorithm-based pricing methods can go seriously wrong during times of crises such as COVID-19 (Torpey and Opdyke, 2020), extreme weather events such as winter storms (Sanchez-Cartas, Tejero, and Leon, 2021), and wildfires (Ongweso Jr, 2021) to name a few – when unprecedented consumer needs can result in unacceptable levels of prices. Ethical business principles rooted in consumer welfare should be prioritized in such situations – and not optimal yield management. As such, marketers need to identify how pricing algorithms can operate more humanely in such situations.

Finally, the third ethical dilemma posed by algorithm-based pricing involves price transparency. As recently highlighted by a variety of researchers (Mehra, 2015; Stucke and Ezrachi, 2016; UK government report, 2018), algorithm-based pricing can provide unrivaled opportunities for collusion and price fixing. While making consumers fully aware about all components of a product price, in real time, could somewhat help mitigate this issue (Ezrachi and Stucke, 2017), it could also further bolster collusion efforts between companies (Van Uytsel, 2018). As such, marketers need to identify how they can practice the principle of price transparency without simultaneously empowering pricing algorithms to practice price fixing.

Course Project Learning Outcomes

This research project will have two components. First, undergraduate students enrolled in the MKTG 302 Marketing Research course were given an opportunity to pursue a secondary research project on any of the three ethical issues associated with algorithm-based pricing identified above. This was 10% of the course credit and not only provided students with an opportunity to learn secondary research, but also instilled Ignatian values of Discernment, Reflection, and *Magis*. Students identified a variety of interesting research questions and potential solutions for each of the three ethical issues associated with algorithm-based pricing. The following are some excerpts from student papers:

Discernment:

"Why would people rather spend $50 out of pocket than not know the price of a primary health care visit?"

"People would rather know how much they are going to spend than be surprised. So, in the interest of consumers, prices should be communicated clearly."

"Prices are so fluctuating and inconsistent so this helps reduce unknown price variation and increase customers financial responsibility."

"It is difficult to not know or understand to cost of a visit so it is important for customers to know how much they are paying. In critical life situations such hospitalizations, people should not have to worry about lack of clarity about costs."

Reflection:

"How does price gouging affect the economy? Can Price gouging laws perpetuate the hoarding of goods and create shortages?"

“Big corporations should be held responsible by the government placing laws on them to not be able to continue this cycle. While third-party venders should be held responsible through jail time or fines because they need to have real consequences.”

“How can professionals find themselves walking the line between raising prices enough to stay in business and remaining fair to their customers?”

“To help the most amount of people during crises where people may not be able to work, each state should have a high budget for supplies to give out during crises, as well as the white house should send out supplies, such as COVID-19 tests that are now being sent out free of charge.”

“Do price gouging laws discourage “innovation and competition?” Is it beneficial for the United States to change their price-gouging statutes?”

“How can we stop surge pricing when it comes to Uber? What can we do to eliminate the pink tax or avoid it? How can we persuade companies to stop using predatory differential prices?”

“How might you (the corporation) make consumers feel comfortable when you invade their digital profile (cookies) to make them personalized ads?”

“Why are companies willing to risk the negative publicity of predatory differential pricing? Is differential pricing sustainable for companies in the long run?”

Magis:

“For big corporations how would you go about trying to be personalized with their customers? If predatory price differentiation can lead to innovation, how might one innovate in a personalized marketing matter?”

“There could be a government law or regulation requiring companies to innovate a product/service when they charge the price higher than the average or when they are accused of “exploiting” their market power.”

“The government could incentivize companies through tax breaks for example to lower their prices for consumers.”

“A message indicating that their information is being recorded for research could relieve some consumers' feelings of uneasiness.”

The second component of this project will involve pursuing scholarly publications on this topic. This will be instrumental in diversifying my current program of pricing research to include the increasingly important topics associated with pricing ethics.

References

Bar-Gill, Oren (2018), "Algorithmic price discrimination: When demand is a function of both preferences and (mis) perceptions." Forthcoming, University of Chicago Law Review 86 (2018): 18-32.

Bertini and Koenigsberg (2021) https://hbr.org/2021/09/the-pitfalls-of-pricing-algorithms

Bryce (2021) https://www.forbes.com/sites/robertbryce/2021/06/11/texas-ratepayers-are-being-saddled-with-nearly-38-billion-in-excess-energy-costs-from-winter-storm-uri/?sh=4a79175c6785

California House (2021) https://speier.house.gov/press-releases?id=C2F060D1-0D84-4824-B9E5-40F879F22CFA

Ezrachi, Ariel, and Maurice E. Stucke (2017) "Artificial intelligence & collusion: When computers inhibit competition." *U. Ill. L. Rev.*1775.

FTC (2014) https://www.ftc.gov/system/files/documents/public_comments/2014/08/00015-92370.pdf

Leber (2015) https://www.fastcompany.com/3052703/the-secrets-of-ubers-mysterious-surge-pricing-algorithm-revealed

Lupkin (2019) https://www.npr.org/sections/health-shots/2019/12/31/792617538/a-decade-marked-by-outrage-over-drug-prices

Martin (2019) https://www.forbes.com/sites/nicolemartin1/2019/03/30/uber-charges-more-if-they-think-youre-willing-to-pay-more/?sh=3674f2ed7365

Mehra, Salil K (2015), "Antitrust and the robo-seller: Competition in the time of algorithms." *Minn. L. Rev.* 100.1323.

NYDCA (2015) https://www1.nyc.gov/site/dca/partners/gender-pricing-study.page

Ohio House (2021) https://ohiohouse.gov/news/democrat/rep-kellys-provision-to-repeal-the-pink-tax-takes-effect-102332

Onswego Jr (2021) https://www.vice.com/en/article/pkb9eg/a-lyft-ride-to-evacuate-lake-tahoe-during-a-wildfire-cost-dollar1500

Pringle (2019) https://www.cbc.ca/news/science/pringle-uber-doordash-gig-economy-1.5238726

Shaker, Marcus, and Matthew Greenhawt (2018), "Association of fatality risk with value-based drug pricing of epinephrine autoinjectors for children with peanut allergy: a cost-effectiveness analysis." *JAMA network open* 1, no. 7 (2018): e184728-e184728.

Stucke and Ezrachi (2016) https://hbr.org/2016/10/how-pricing-bots-could-form-cartels-and-make-things-more-expensive

Tanner (2014) https://www.forbes.com/sites/adamtanner/2014/03/26/different-customers-different-prices-thanks-to-big-data/?sh=1c53f42f5730

Torpey and Opdyke (2020) https://www.bloomberglaw.com/product/health/document/X7J7FB08000000

UK government report (2018) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746353/Algorithms_econ_report.pdf

White House Archives (2015) https://obamawhitehouse.archives.gov/sites/default/files/whitehouse_files/docs/Big_Data_Report_Nonembargo_v2.pdf

Van Uytsel, Steven (2018) "Artificial intelligence and collusion: A literature overview." *Robotics, AI and the future of law* (2018): 155-182.