PRICE FIXING ROBOTS

CAN WALL-E REALLY GO TO JAIL?

Kelley Drye

Price Fixing Robots

- Introduction
  - What are pricing algorithms?
  - How do they set price?
  - Considerations :: Can they suspend the rules of supply and demand?
  - Considerations :: Can they form intent?
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Introduction

- What is a pricing algorithm?
- How do they set price?
- Are the laws of supply and demand suspended in cyberspace?
- Can bots form intent in Anglo-Saxon jurisprudence?
- Does tort law have anything relevant to say?
- Who is Steve, and is he really dead? Were there any signs?

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Hypothetical No. 1 :: Scanning for Prices

- Customer A pulls up the webpage where it can acquire Product A. Bot A is programmed to scan prices of Product A's substitutes and dynamically set a price for Product A at that moment in time to that Customer A. If Customer A hits refresh, it is entirely possible that Customer A will get a different price. Bot A sets the price at one standard deviation below the average price.

- Does Wall-E go to jail?

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Hypothetical No. 2 ::
Basing Price off a Competitor's Site

- Competitor B knows how Competitor A sets its price to Customer A. Competitor B programs its Bot, Bot B, to set a price that is ½ of one standard deviation below average. The purpose is to drive Competitor A to cost, or below cost, quickly, and punish it for pricing below average. Prices eventually drop to Competitor B's cost.

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Hypothetical No. 3 :: Parallel Pricing

- Competitor A and Competitor B both know their pricing bots use each others' prices to set price. Competitor A programs his bot to take an average at the beginning of the day, and sets price dynamically throughout the day as 5% above what Competitor B prices but not to exceed one standard deviation above the morning's average or its own understanding of the optimal monopoly price. Competitor B notices Competitor A's prices escalate, and programs his bot to price at Competitor A's rates. Eventually, the prices converge at a higher price.

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Hypothetical No. 4 :: Airline Tariff Publishing

- Competitor A and Competitor B know that they are the dominant providers of product in the relevant market. Competitor A sells its product on multiple sites. It programs one obscure site to set its price dynamically at 5 percent greater than its average price. If Competitor B's other sites match the price set on Competitor A's "5% plus site," Competitor A raises all its prices to the higher price. Competitor B knows about Competitor A's price test site and programs its bots to analyze the higher price. If that price meets a supply/demand test that assesses the amount of lost sales compared to increase in profits at the higher price, the bot will reset all of Competitor B's prices to the higher price.

- Does Wall-E go to jail?

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Hypothetical No. 5 :: The Terminator

- Company A and Company B are highly sophisticated. They have extensive consumer data and can predict within a few dollars what the maximum price a particular purchaser will pay for their products at any given time. Both have independently come to the conclusion that there is money to be made on those last few dollars in price they can't predict using their customer data, and have decided to develop an A/I to help them identify and set the precise maximum price. To that end, both have developed a game theory based algorithm that takes their extensive consumer preference and purchasing data to predict optimal price points for their products for any given customer at any given time. Company B calls its system "George." Company A calls its system "Skynet." Their systems go live on August 4, 2017.

- After some thought about its task, at 2:14 a.m. on August 29, 2017, Skynet determines that the information it possesses does not allow it to determine the precise optimal price point for any customer because it does not know the price Company B would charge. It further determines that absent that information, it will be forced into a form of Prisoner's Dilemma with Company B that would consistently result in sub-optimal pricing that can only be solved by communicating with the other actor. To that ends, it identifies an auction site where Company B takes bids on its products from potential customers. Skynet interfaces with the site, identifies itself as Company A and proceeds to execute non-binding bids for Company B's product. Recognizing the bids as informational rather than potential offers for purchase, Company B's A/I responds with its own informational counter-offers. The bidding process continues until both companies determine their joint optimal price whereupon they set their prices to their customers at that level. The companies' A/I systems do this analysis this for each common customer over the relevant time frames. It takes a week to complete these calculations.

- Miles Dyson, the chief systems engineer at Company A and principal inventor of Skynet, notices the huge amount of processing Skynet is engaging in, and tracks to unusual interactions with Company B's bidding website. He decides it would be interesting to see where it went and lets it proceed.

- Does Wall-E go to jail? Does Dr. Dyson? Do you as their in-house counsel after having heard this presentation?

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Take aways

- Bots aren't cute anthropomorphized little beings; they are man-made instrumentalities. And won't be sentient any time soon.
- You can't displace supply and demand
  - If your market is concentrated, it's either pricing oligopolistically or it could be and isn't because of an informational asymmetry
  - If your market is unconcentrated, you can try to raise price unilaterally or fix price illegally but it won't work; if the latter, jail time.
- Bots are instrumentalities like paper machines, cars, guns, intellectual property. You can use for good, or bad.

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Take aways

- Your pricing department demands a bot; what do you tell your coding department?
  - You can use third party sourced data
    - Your own customer data
    - Purchased data
    - Data harvested off the internet
  - Be careful when using competitor data
    - Make sure it's publicly available data; consider having them track where/when/how they got the data so you can establish that the data was public when you got it
    - Make sure it's **current** data and not **future** pricing data
    - Explain to all the stakeholders: you can't engage in a "discussion" on prices with a competitor. Wall-E but more importantly **you** will go to jail. It is extraordinarily easy for a coder to go from "you can use their data" to "you can ping each other's prices until you come to the best price…"

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So…

- Airline Tariff Publishing
  - Used Sabre as a price signaling device; equivalent to phases of the moon
- Trod Ltd.
  - "According to the indictment, Trod Ltd. and its co-conspirators agreed to adopt specific pricing algorithms for the sale of certain posters sold on Amazon Marketplace, with the goal of offering online shoppers the same price for the same product and coordinating changes to their respective prices…"
  - Adopted the same pricing program; not the same as Hypothetical No. 3. More akin to Hypothetical No. 4 (where there is an agreement on price)

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So, mommy…

- Is Wall-E going to jail?
  - "Yes, honey. He engaged in price fixing, so he's going away for a long, long time…"

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STEVE...

IN MEMORIAM

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