Economic and Legal Effects of Algorithmic Pricing

Data Science Meetup Nice Sophia-Antipolis
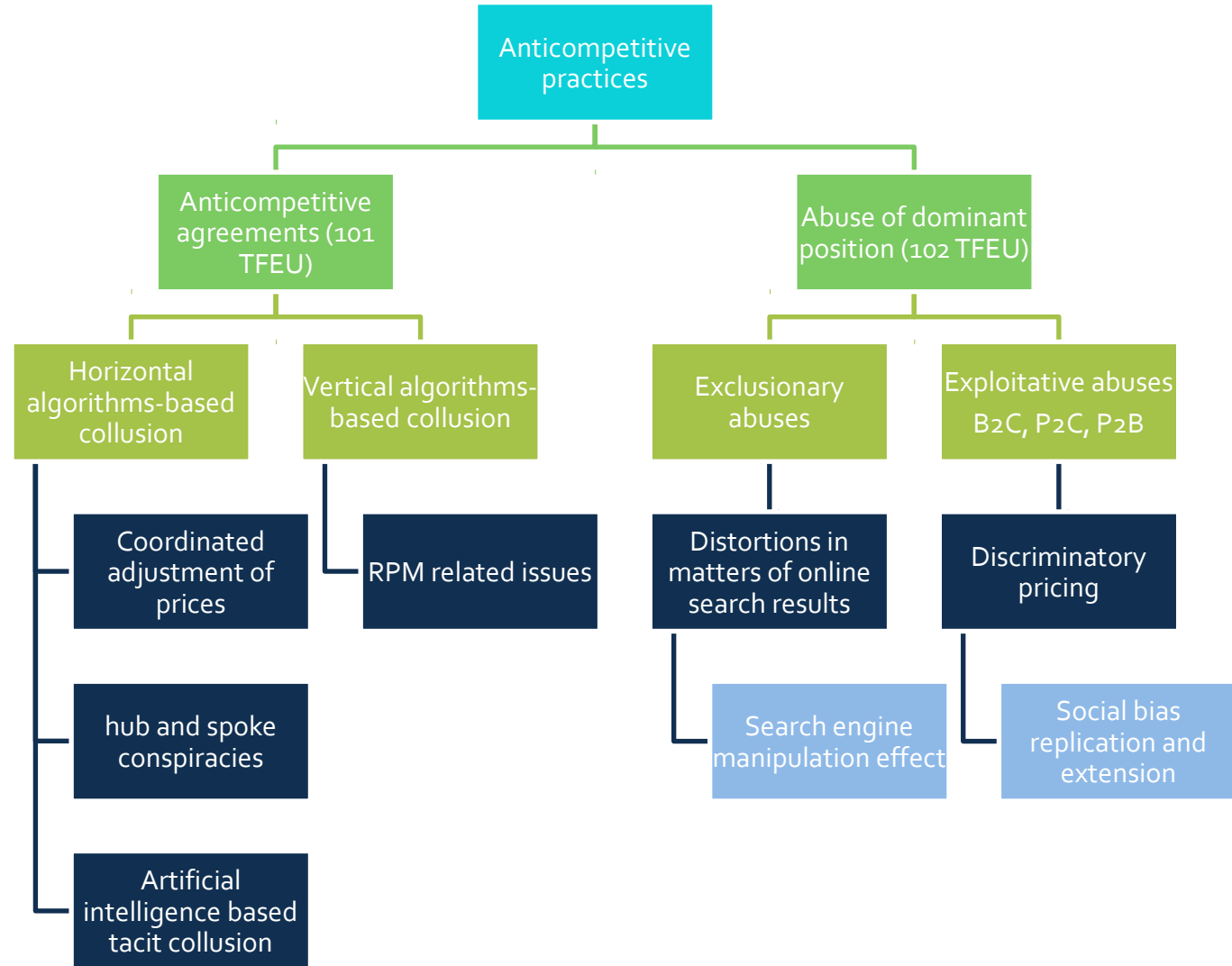
Frédéric Marty, CNRS

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Algorithms-based economy, anticompetitive practices, and academic bubble ?

- Increasing competition law related concerns about the effects of algorithms on competition?
  - Abuse of dominant position:
    - Exclusionary abuses through search algorithms
    - Personalized prices and perfect discrimination → undue wealth transfers between consumers and producers
    - Bias replication and confirmation
  - Collusions
    - Explicit or tacit collusions produced by price algorithms

- A recent but significant academic literature

- A growing concern for public authorities
  - White House Council of Economic Advisers (2015)
  - Autorité de la Concurrence and Bundeskartellamt joint report (May 2016)
  - e-commerce inquiry of the European Commission (September 2016)
  - OECD reports : Price discrimination and competition (November 2016); Algorithms and collusion (June 2017)

Outline

1. Algorithms and anticompetitive practices : an overview
   A. Collusion (art 101 TFEU / Section 1 Sherman Act)
   B. Exclusionary abuses (art 102 TFEU/ Section 2 Sherman Act)
   C. Exploitative abuses (art 102 TFEU)

2. The specific case of discriminatory prices
   A. Algorithms based enhanced discrimination capacities : myth or reality?
   B. How to address this issue?
      i. Market self-regulation
      ii. Ex post enforcement of competition law provisions
      iii. Ex ante public regulation
      iv. Consumer countervailing market power

Algorithms and anticompetitive practices: an Overview

Anticompetitive practices

Anticompetitive agreements (101 TFEU)

Abuse of dominant position (102 TFEU)

Horizontal algorithms-based collusion

Vertical algorithms-based collusion

Exclusionary abuses

Exploitative abuses B2C, P2C, P2B

Coordinated adjustment of prices

RPM related issues

Distortions in matters of online search results

Discriminatory pricing

hub and spoke conspiracies

Search engine manipulation effect

Social bias replication and extension

Artificial intelligence based tacit collusion

Algorithms-based collusions: Three models

Coding an algorithm to collude

Hub and spoke conspiracy

AI based tacit collusion

Algorithms-based collusions: Three models

Coding an algorithm to collude

- The competitors use the same algorithm to adjust automatically and instantaneously their prices
- The Topkins case on the Amazon Market Place (April 2015)
- The smoking gun as an Achilles' heel

Algorithms-based collusions: Three models

Hub and spoke conspiracy

- An online platform may be used to coordinate horizontal competitors
- An US law suit against Uber (a class action against Travis Kalanick former CEO of Uber, launched in December 2015)
- See also the Eturas case (EU Court of Justice, 2016, Lithuanian travel agencies' reservation system)
  - Reinforcing tacit collusion by increasing awareness on the effects of discounts

Algorithms-based collusions: Three models

AI based tacit collusion

- AI based algorithms may help to reach tacit collusion equilibria
- Competition authorities encounter major difficulties to sanction these type of abuse of collective dominant position
- if these equilibria are difficult to realize through human coordination, an AI algorithm can easily understand the *pattern* of the market
- The equilibrium will be more stable because of the absence of any human bias in terms of market analysis or reaction,
- The neuronal and constantly evolving nature of the code deprives the competition authority of any smoking gun

Exclusionary abuses

- Anticompetitive gearing
  - Search engine manipulation effect
    - Google Shopping case, DG Comp, June 2017
    - Google Search, Competition Commission of India, January 2018
  - Personal assistants and competition concerns
    - Vertical integration concerns – giving an advantage to some products at the expense of alternative providers
    - Market foreclosure by consumer choice restriction
- Exclusionary effects of discriminatory pricing ?
  - Micro-targeted predatory strategies
  - Sanctions of lack of loyalty through profiled discounts
  - Raising rival costs' strategies
  - Horizontal effects on the downstream markets of vertical discriminatory practices

Search engine manipulation effect: an example

- An example: distorting natural search results in order to privilege downstream services of a vertically integrated dominant operator at the expense of its downstream competitors

- A well known leveraging strategy (see the MS case for instance)

- This type of practices corresponds to the formal procedure opened since 2010 by the DG Comp against Google Shopping (case 39740 Google Search)

- Distorting natural results would impair the capacity of its competitors to exert a competitive pressure and weakened and finally marginalized them (IP/16/2532)

- The decision was issued last June
  - Not only a significant monetary fine but also a concern about the remedies
  - How to avoid a distortion of the research results at the advantage of its competitors?

Exploitative abuses

- DG Comp Inception Impact Assessment, October 2017

- P2B practices : an issue of "abuse of economic dependence"?
  - The market place is the main gateway to market
  - The bargaining power imbalance may produce unfair commercial clauses
    - Delisting threats
    - Opacity of the ranking algorithms and risks of discrimination between suppliers or undue advantage granted to the platform's own products in the case of a vertical integration
    - Imposing expensive and unnecessary auxiliary services
    - Hampering a direct access to customers and to their data

- B2C and P2C practices: an increasing capacity to implement discriminatory pricing?

Mapping discriminatory pricing strategies

Price discrimination

1st degree : price = maximal propensity to pay

2nd degree: price modulation according to the quantities

3rd degree : customers' segmentation according to their expected price elasticity

Is perfect discrimination still a myth?

- A theoretical case which may happen through big data and enhanced processing capacities

- A difficulty : separating perfect discrimination from peak-load pricing (see for instance the Uber surge algorithm or the airplane tickets pricing)

- Personalization may not be limited to prices : versioning strategies (adjusting quality and performance to prices)

- A profitable strategy for a dominant operator
  - Increasing financial returns (consumer welfare confiscation)
  - Strengthening dominant position
  - Reducing market transparency and limiting competitive pressure

- A possible but challenged positive effect on total welfare

- An undue transfer of wealth at the expense of final consumers

The potential negative impacts of price discrimination on consumer welfare

Wealth confiscation

Decision manipulation: price steering strategies, emotional pitch

Drip pricing strategies

Reduction of the liberty of choice

Privacy concerns
Perceived unfair practices
Mistrust in markets

A zombie theory?

- "The mystery about online price discrimination is why so little of it seems happening?"

- A controversial example: the Amazon random pricing strategy in 2000

- Conflicting sector-specific assessments : airline tickets / U.S. e-commerce

- Geo-blocking strategies

- A first degree discrimination or a micro-targeted third degree one?
  - Aggregated data
  - Prediction on the future behavior of an anonymous user considering its attributed pattern (behavioral analysis)
  - Discrimination based on rough indicators (OS for instance)
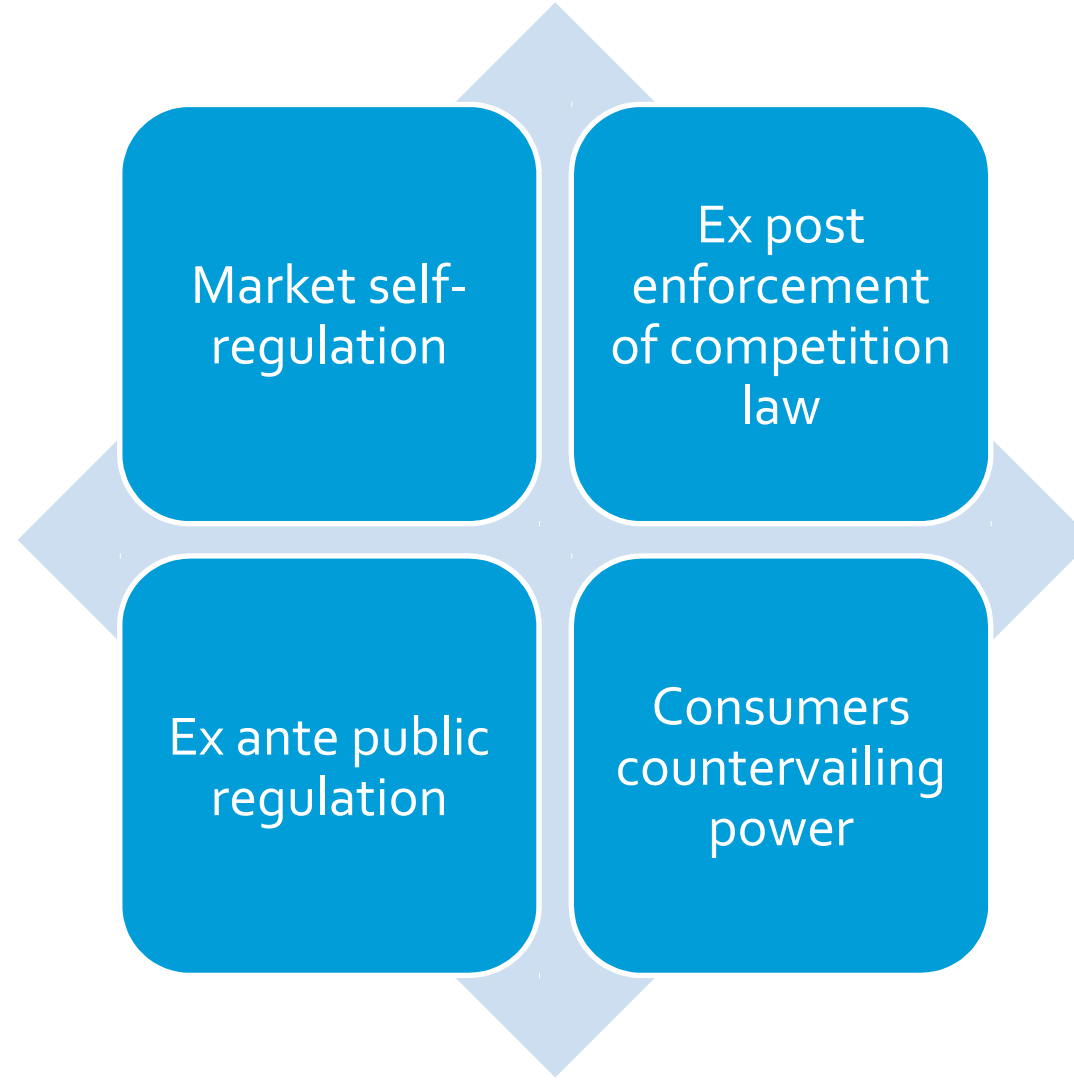
How to address discrimination based competitive concerns? Self regulation and competition law enforcement

- Can we trust in the self-regulated nature of the market?
  - Is the contestable markets approach still valid?
  - How to conciliate collusion concerns and discriminatory pricing denunciations?
  - How to take into account the secondary transactions among consumers?

- Are competition law based remedies adequate?
  - A significant reluctance for the EU Commission to tackle the exploitative abuse issue
    - Discrimination without domination?
      - See online market places (price level and price dispersion for old books – Ellison and Ellison, 2018)
  - Excessive pricing is not an Antitrust incrimination in the U.S.
    - A sanction of an unfair commercial practice ? (section 5 FTC Act)

How to counterbalance discriminatory strategies?

Public Regulation

- Competition law based tools
  - Sanctioning exploitative abuses (art 102 TFEU)
  - Sanctioning unfair commercial practices (Section 5 FTC Act)
  - Addressing the issue of market power (bigness as a legitimate concern whatever its consequences in terms of efficiency and its origin)

- Personal Data Protection (GDPR – April 2016)
  - Personal data, automatized processing
  - I.A. based systems do not mandatory rely on this type of data

How to counterbalance discriminatory strategies?

Consumers' backlash

- An effective countervailing buyer power?
  - Reputational damage
  - Increasing opacity on the consumer side and increasing their distrust
  - Suboptimal switching to other platforms
  - Valorising commitments in terms of privacy

How to counterbalance discriminatory strategies?

Consumers' backlash

- An algorithmic combat?
  - IP dissimulation
  - Price comparators, distributed watchdog systems
  - Shopping bots (also an issue of transparency and supervision)

- Empowering consumers (algorithmic consumers)
  - Can the algorithms be accountable?
    - Far from obvious if I.A. is at stake : the algorithm just makes a prediction – there is just an inference based on data, not a causal explanation
    - Ex post reviews are particularly difficult to implement : code is no longer the law, data are.
  - Combining *surveillance* (periodical monitoring of compliance) and *sousveillance* (distributed screening also based on big data)?
  - Requiring a counterfactual explanation ? The closest possible world?

The economic issues beyond the legal-technological nexus

- A public policy issue
  - The effects of discrimination differ according to the type of consumers (well-informed vs naïve ones who act under bounded rationality)
  - Social effects of algorithmic discriminations : amplifications and confirmation effects of social discriminations (ex Airbnb)
  - Efficiency and fairness limits of algorithmic decision
  - What happens if the algorithm decides? (*the blackbox makes me to do it*)
    - Man out of the loop- considering the cost of errors (false positive issue)
    - Law, economics, and algorithms : the notion of algocracy and its performative effects
    - The prediction made by the algorithm determines the paths opened to the consumer
  - An issue of fundamental rights beyond privacy related dimensions
  - Welfare distribution is not neutral in terms of economic efficiency

frederic.marty@gredeg.cnrs.fr

http://unice.fr/membres/tous-les-membres/gredeg/marty-frederic (homepage UCA)

@fred_marty (Twitter)