

REMEDIES FOR ALGORITHMIC COORDINATION?

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**CAN ALGORITHMS INCREASE
COORDINATION?**

**IF YES- HOW CAN IT BE
REMEDIED?**

For this lecture, I **ASSUME** that algorithms can assist coordination

Stigler's conditions for coordination

1. Agreement
2. Detection
3. Sanction

Algorithms as “recipes for action”

Michal Gal, “Algorithms as Illegal Agreements”,
Berkeley J. of L. and Tech (2018) <https://ssrn.com/abstract=3171977>

REMEDIES FOR ALGORITHMIC COORDINATION?

Methods of Digitalised Coordination: (Ezrachi and Stucke, 2016)

Traditional collusion (Topkins, Asus: Algorithm as a **Tool**)

Hub and Spoke (Luxemburg Taxis, Eutoras, Ageras)

Expert coded coordination (e.g. leader-follower)

Most Difficult case:

Unsupervised learned coordination (Calvano et al.)

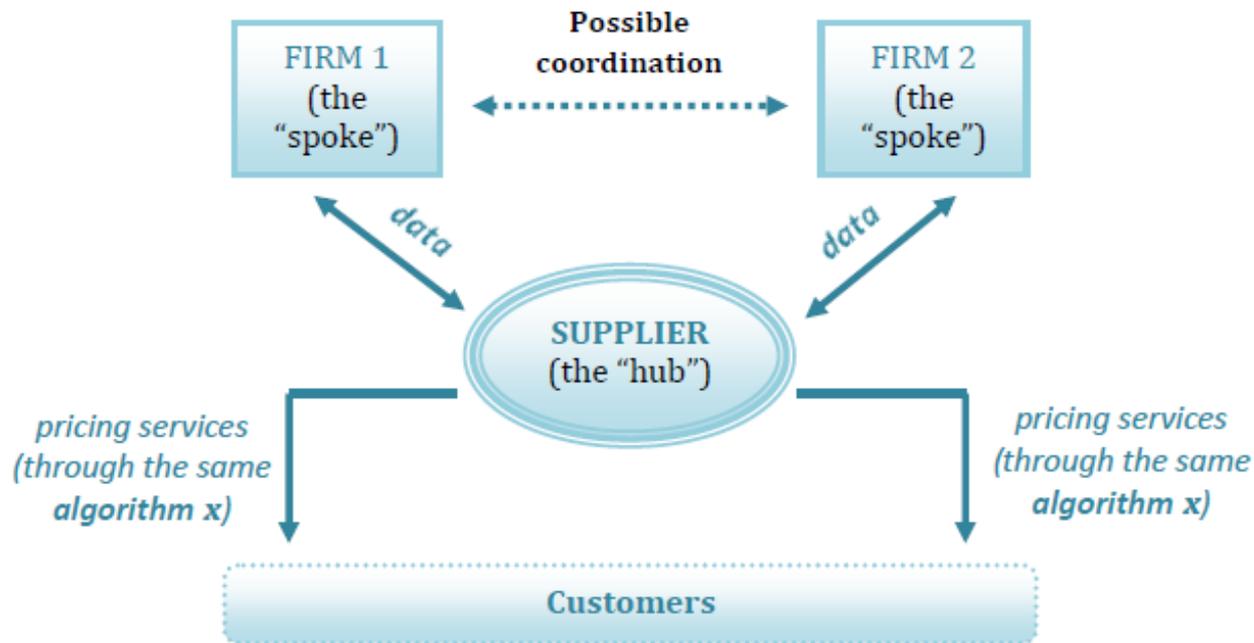


Figure 8 – Algorithm- and data-fueled Hub-and-Spoke

Image: Manzini (2019)

- Eutoras: **Presumption of participation** if the natural person was **aware** of change in algorithm that facilitates coordination

Ageras (Danish Comp. Council, 30 June 2020)

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Deep learning

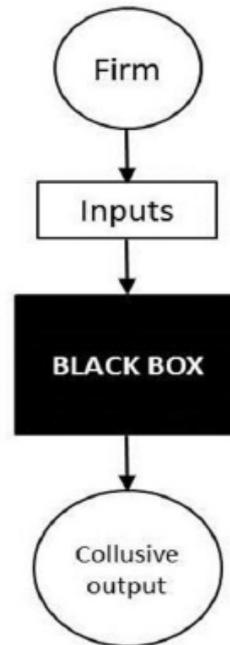


Figure 10 – Deep learning algorithm (Source: Organisation for Economic Co-operation and Development (OECD), *Algorithms and Collusion: Competition Policy in the Digital Age* (2017), 32)

Will law school help?

“It is a hypothesis that not all algorithms will have been to law school. So maybe there is a few out there who may get the idea that they should collude with another algorithm who haven’t been to law school either”

Margarethe Vestager, Eur. Commissioner for Competition

<https://uk.reuters.com/article/us-eu-antitrust-algorithm/eu-considers-using-algorithms-to-detect-anti-competitiveacts-idUKKBN1I5198>.

Collusive agreement  **illegal**

Oligopolistic Coordination  **legal**

Does algorithmic coordination create an “agreement” in the legal sense?

“Agreement?”

- Must involve either express or implicit formulation: **‘concurrence of wills’; ‘meeting of the minds’**
- Requires **communication** between competitors which signals intent to act in a coordinated way, and their reliance on each other to follow suit.
- **The mode of communication**, as well as the types of information communicated, play a decisive role

Yet....

- **Mere interdependent conduct**, in which competitors act unilaterally while taking into account the probable reaction of their rivals, does not constitute agreement.

Application to algorithms

- The fact that coordination is achieved through algorithmic interactions does not prevent proof of an agreement
 - Maureen Ohlhausen: if the word “algorithm” can be replaced by the phrase “a guy named Bob,” then algorithms can be dealt with in the same way as traditional agreements
- Is there discord between existing conceptions and assumptions—shaped to apply to human interactions—and the digital world?
- Intent?
 - algorithms “intend” to achieve certain goals by using certain strategies
 - the intent of the designer to create coordination by use of algorithms?
 - the intent of the user to employ such an algorithm?
- Communication?
 - Communicating through the decisional parameters coded into them or set by them in the case of machine learning- is this enough?
 - Yet the use of an algorithm is not prohibited if it simply reacts to market conditions set by others, without reaching an agreement

Facilitating Practices/Plus factors

Intervention triggers: Avoidable practices that make it easier to coordinate, without offsetting benefits to consumers

Does the algorithm facilitate or strengthen in a non-negligible way the ability to reach or maintain a jointly profitable market equilibrium?

no → legal

yes ↓

Is the use of the algorithm justified by neutral or procompetitive considerations?

no → illegal

yes ↓

Do these considerations outweigh the algorithm's coordination-facilitating effects, and are the latter needed in order to enjoy the former?

yes → legal

no ↓
illegal

Michal S. Gal, "Algorithms as Illegal agreements" *Berkeley Technology Law Journal* (2018) <https://ssrn.com/abstract=3171977>

boundary of legality ?

Transparency of algorithm?

Sharing of data?

Use of same (inefficient) data pool?

Use of similar (inefficient) algorithm?

Suggested Solutions: within the law

- Algorithmic transparency and explainability (Ezrachi and Stucke)
 - Costs
 - Will it not strengthen coordination?
- Create a toolbox for detection
 - Intervention triggers (Motta and Peitz): Automatic monitoring of anomalies
 - Data units in competition authorities
- Joint Monopoly
- Germany's Monopolies Commission:
 - Reversal of the burden of proof in competition proceedings with regard to the damage caused by an infringement of competition law; the finding of a collusive use of price algorithms would give rise to the presumption of an excessive price.
 - liability to third parties such as IT service providers on design of price algorithms.

Changing the law: Competition-by-design

Suggestion: focus on conduct or outcome (Calvano et al., 2020, *Science*)

What has changed? We can “read the mind” of the algorithm

The process that produces higher prices			
	COMMUNICATIONS	COLLUSIVE PRICING RULES	HIGHER PRICES
Humans	Present, discoverable	Latent, not discoverable	Observable, difficult to evaluate
Algorithms	Not present	Latent, discoverable	Observable, difficult to evaluate

Benefits:

- Goes to the root of the coordination
- Aligns with experimental findings
- May be applied ex ante (competition-by-design)

Potential problems

- Legal limitations
 - Section 5 FTC?
- **Identifying the pricing rules that create coordination**
 - What exactly will we prohibit?
 - Creating certainty via lab tests?
- **Which information should be ignored by the firm?**
 - Is it different from our practical inability to prevent human-created oligopolistic coordination?
 - How will it affect innovation?
 - If require to price only based on costs, is this not price regulation?

Private remedies: Johnson, Rhodes and Wildenbeest (2020)

Suggested Solutions (Gal, 2021)

- Merger Policy? (Gal, 2021)
 - Change counterfactual: Algorithms change conditions for coordination
 - Will mergers become redundant in coordination cases?
 - Justification for prohibition weakened
 - What presumptions?
 - Structural remedies less effective (Coutts)
- Disruptive algorithms (Gal, 2021)
 - Create noise in the system on the supply side
- Algorithmic consumers (Gal and Elkin-Koren, 2019)
 - Create noise in the system on the demand side: faking/hiding demand
 - Offline transactions?

Some Resources

- Ariel Ezrachi and Maurice Stucke, *Virtual Competition* (Harvard University Press, 2016)
- Gal, Michal “Algorithms as Illegal agreements” *Berkeley Technology Law Journal* (2018)
<https://ssrn.com/abstract=3171977>
- Emilio Calvano, Giacomo Calzolari, Vincenzo Denicolò, Sergio Pastorello, Artificial Intelligence, Algorithmic Pricing, and Collusion 110(10) *American Economic Review* 3267-97 (2020) <https://ssrn.com/abstract=3304991>
- Gal, Michal and Elkin-Koren, Niva, Algorithmic Consumers, 30 *Harvard Journal of Law and Technology* (2017)
<https://ssrn.com/abstract=2876201>
- Gal, Michal “Tools for Limiting Algorithmic Collusion” (forthcoming, 2021)

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