

# New Tool and Old Friend: Updating Cartel Screening with AI Systems

Jerome De Cooman

[jerome.decooman@uliege.be](mailto:jerome.decooman@uliege.be)

30 June 2022, Porto



# Introduction



- ▶ Algorithmic (tacit) collusion and price discrimination have become the White Whale of antitrust
- ▶ But AI systems might also be used by competition authorities to assess and control proper competition
- ▶ As a technology, AI is a *pharmakon*, i.e both poison and remedy
- ▶ This paper assesses the side effects of that remedy

## II. Current Investigation Methods



- ▶ Cartel takes place “*behind a veil of dishonesty*” and wear a “*cloak of secrecy*” (OECD 2001)
- ▶ Upshot? Few cartels discovered (Bryant and Eckard 1991, Combe 2007, Ormosi 2020, Combe 2020)
- ▶ Solution: Leniency programmes
  - › Break the omerta code among cartel member by offering amnesty to the first-in-the-door (Zingales 2008)
  - › Are resource-efficient (Harrington 2008) as they provide first-hand evidence (Stephan 2009)
    - » reduction of investigation and prosecution costs and reduction of the duration of the procedure (Brenner 2009)
  - › Deter cartel formation as cartel “*is a game of trust*” (Leslie 2004)

# II.A. Leniency Programme



## ► However:

### › Controversial effectiveness:

- » *“Success is to be measured by a small number of cartels, not a large number of leniency applications”* (Harrington and Chang 2015)
- » *“What consumers and industry ultimately need is an economy that doesn’t have cartels in the first place”* (Vestager 2021)

### › Deterrence gap

- » The majority of investigations starts after a leniency application (Archimbaud 2020)
  - » Low probability of detection through *ex officio* investigation (EU Court of Auditor 2021)
  - » The carrot is amnesty, the stick the probability of detection: Expected value of penalty  $\leq$  or  $\geq$  profit driven from cartelisation? (Deschamps and Marty 2006)
- › *“While there is a recognition that a leniency program is an immensely valuable tool (...) concerns arise when it is the only tool”* (Harrington and Chang 2015)



## II.B. Screening Tools

- ▶ There is “*conventional wisdom on collusion*” that permits the identification of “*factors that are supposed to hinder or facilitate*” collusive behaviours (Tirole 1988)
  - › Structural screens: analysis of market structure
  - › Behavioural screens: analysis of the collusive methods or outcome of collusion
- ▶ The probability of cartel detection is not exogenous and depends on competition authorities’ choices (Combe 2020)
  - › Finite resources lead to different priority degrees (CJEU, *Automec srl v Commission* 1992)
  - › The Commission is free to focus “*its enforcement resources on cases where it appears likely that an infringement may be found*” (Commission Notice 2011)



## II.B. Screening Tools – Forest for the trees

- ▶ *“Economists have developed literally dozens of oligopoly pricing theories”*  
(Scherer 1970)
- ▶ *“Virtually anything can happen”* (Stigler 1964)
- ▶ *“None of the collusive markers identified are universal, and each must be used with caution”* (Harrington 2008)
- ▶ Screening literature is therefore sometimes qualified as a *“forest for the trees”*  
(Stenborg 2004)

## II.B. Screening Tools – Resource and data requirements



- ▶ Screening is a resource and data-intensive activity
  - › Data obtained from undertakings: Reliable but impossible to access them without tipping them off
  - › Publicly available or aggregated data: far less trustworthy (OECD 2013)
- ▶ Upshot? It is *“neither productive nor efficient”* to *“implement screens in every market and at every moment in time”* (Abrantes-Metz 2013)
- ▶ Even if reliable data available, the extensive cost of developing and implementing screens might be burdensome for certain competition authorities (Kovacic 2013)



## II.B. Screening Tools – Type I and Type II Errors

- ▶ Type I Error (false positive): erroneously detecting a cartel
- ▶ Type II error (false negative): not detecting a cartel despite its existence
- ▶ Origins?
  - › Misspecification of the (non-)collusive model: *“if you put garbage in, you get garbage out”* (Abrantes-Metz and Sokol 2012)
  - › Data *“originates from antitrust cases and may therefore be subject to selection bias”* (Symeonidis 2003) as collusive markers are built on discovered and successfully prosecuted cartels (Groutt and Sonderegger 2006)



# III. *Intermezzo*: The Need for a New Tool



- ▶ Despite leniency programmes and screening methods, the probability of cartel detection is still around 15% (Combe 2020)
- ▶ There is however an almost ten year long political initiative to update competition law enforcement in light of digital technology
  - › *“We must take much better use of the great opportunities offered by digital technologies”* (Juncker 2014)
  - › The Commission *“will continue to monitor the opportunities and challenges brought by artificial intelligence solutions”* (EC 2017a)
  - › Consultancy tender aimed at gathering *“informed knowledge (...) about existing AI solutions”* for law enforcement and particularly how AI *“could potentially improve DG Competition’s processes of evidence management, legal drafting and market intelligence gathering”* (EC 2017b)



### III. *Intermezzo*: The Need for a New Tool

- ▶ In light of priority and resources allocation, AI systems help the competition law authorities initiate the “*right investigation*” (van Bonin and Malhi 2020)
  - › Refinement of Regulation 1/2003 ambition of “*freeing up resources to focus on serious infringement*” (§ 36).
  - › New tool and old friend
  - › AI systems draw the sketch of suspicious businesses by identifying cartelists’ recurring characteristics or patterns (Sanchez-Graells 2019)
  
- ▶ “*Algorithmic shift in the fight against cartels*” (de Marcellis-Warin, Marty and Warin 2022)
  - › Process data quicker and more efficiently
    - Sooner identification of market deficiencies
    - Shift from reactive claim to proactive investigations
    - Increases the probability of detection that increases the efficiency of leniency programmes

# IV. Assessing Algorithmic Screening



- ▶ AI is not a silver bullet that leads to a “*theory of everything*” (Schrepel 2021)
- ▶ AI is not Types I and II error-proof, yet its reliability rate is above 80% (Walliman, Imhof and Rutz 2018)
- ▶ Regarding data management
  - › AI outperforms the evidence management (Lim 2021)
    - » e.g.: Google Shopping: 5.2 Terabytes = 1.7 billion Internet search queries
    - » e.g.: Bayer-Monsanto merger: over 2.7 million document
  - › Using NLP to find “*the needles in these haystacks*” (Hunt 2017)
- ▶ Regarding data requirement:
  - › AI systems still need data and best quality data are not always publicly available (// with Casey and Niblett 2021)
  - › Upshot? Risk of biased competition law enforcement resulting from the application of AI systems to detect abnormal patterns due to a different level in data availability (von Bonin and Malhi 2020)

# IV. Assessing Algorithmic Screening: Cognitive Bias



- ▶ Using AI systems during the initial assessment phase could lead to an *enforcement bias*
- ▶ Overreliance upon such tools undermines the principle of good administration as excessive automation lead to complacency in the part of officials (Wickers *et al.* 2015)
- ▶ This is due to the automation bias, *i.e.* the irrational tendency to rely on automated decision even when the operator suspect malfunction (Goddard *et al.* 2012).

# IV. Assessing Algorithmic Screening: Automation Bias



- ▶ The automation bias is the digital update of:
  - › Search satisfaction: stop searching once a first plausible explanation is found
  - › Anchoring: premature decision-making based on limited information initially available
  - › Confirmation bias: tendency to interpret information to fit the preconceived opinion
  
- ▶ The algorithmic recommendation is:
  - › A first plausible explanation...
  - › ... that tempts the officials to cease the scrutiny...
  - › ... and even if further investigation were to be conducted, the recommendation would serve as an anchor as any new information gathered would be interpreted as strengthening the preconceived opinion.

# IV. Assessing Algorithmic Screening: Automation Bias



- ▶ Algorithmic screening also challenges the right to state reasons for administrative decisions (art. 41 EU Charter)
- ▶ Going against the recommendation would require a well written reasoned decision that renders *“the exercise of discretion costlier”* (Petit 2018)
  - › *“A hearing officer’s belief that computer decisions are error-resistant increases the likelihood of inaccurate outcomes”* (Citron 2008)
  - › *“Computers also benefits from their traditional reputation of being intelligent and fair, making them seem credible sources of information and advice”* (Fogg 2003)

# IV. Assessing Algorithmic Screening: Self-fulfilling prophecies



- ▶ Recommendation at time  $t$  is based on data  $t-1$
- ▶ Recommendation at time  $t$  becomes data for recommendation at time  $t+1$
- ▶ *Etc.*
- ▶ Recommendation at time  $t+n$  mirrors past decisions (Casey and Niblett 2021)
- ▶ Reinforces the feedback loop (Lanzing 2019)
- ▶ The automation bias strengthens the loop as officials do not easily deviate from the recommendation



## V. Beyond Oblivion: Policy Recommendations

- ▶ This paper is not a pamphlet against algorithmic screening
- ▶ The counterfactual scenario of not using these tools is full reliance on competition authorities' officials
- ▶ There is no evidence human decision is “significantly more accountable than AI” (Lim 2021)
- ▶ Both individual (Coglianese 2022) and groups (Callon and Latour 2006) are black boxes
- ▶ The question is therefore not whether algorithmic screening is perfect, but rather what will work better





# V. Beyond Oblivion: Policy Recommendation

## ► Understanding the purpose:

- › Algorithmic screening tools are recommender systems (Yeung 2018)
- › They raise red flags but do not proof collusion (Harrington 2008)

## ► Understanding the functioning:

- › Human agency and oversight
  - » human must be able to make informed decision
  - » This requires they receive “appropriate knowledge and tools to comprehend and interact with AI systems and (...) be enabled to challenge the system” (HLEG 2019)

# V. Beyond Oblivion: Policy Recommendation



- ▶ Good news is, the AI Act crystallises human agency and oversight
  - › AIS should be designed “in such a way to ensure that their operation is sufficiently transparent to enable users to interpret the systems’ output (art. 13(3) AI Act)
  - › Users must be able to “fully understand the capacities and limitations of AIS” (art. 14(4)(a)), to “remain aware of the possible tendency of automatically relying or over-relying on the output produced (automation bias)” (art. 14(4)(b)), to choose when not use the AIS or discard the recommendation (art. 14(4)(d)).
  - › To remain aware of “possibly biased outputs due to outputs used as an input for future operations (feedback loops) (art. 15(3)).
- ▶ Bad news is, the AI Act is not fully applicable to competition law proceedings

# Conclusion



- ▶ *“When all possibilities would become probabilities, every possibility is the next thing to a certainty” (Melville, Moby Dick, 1851)*
- ▶ Screening raises possibilities of collusion, nothing more (but also nothing less)
- ▶ Competition authorities have to remain aware of AIS’ limitation.
- ▶ If not, they might well be doomed to embody Ahab’s fate, equating probabilities and certainties



**LIÈGE université**  
**Cité**

# III. Algorithmic Decision-Making under the AI Act



- ▶ Do algorithmic screening tools fall within the scope of application of the AI Act?
  - › “Without any prejudice to the application of Union competition law” (Explanatory Memorandum)
  - › This is not a dead-end
  - › AI system is a software that generates either content, predictions or recommendations given a set of human-defined objectives (art. 3(1) AI Act)
  - › High-risk AI system is
    - » Either covered by sectorial product legislation listed in Annex II and used as a product or a safety component (art. 6(1)(a) AI Act) for which a third-party conformity assessment is required (art. 6(1)(b) AI Act)
    - » Or not covered by sectorial product legislation but still considered as high-risk and as such listed in Annex III (arts. 6(2) and 7 AI Act).

# III. Algorithmic Decision-Making Under the AI Act



- ▶ Law enforcement activity mentioned in Annex III
  - › The AI Act defines law enforcement authority as any public authority competent for law enforcement activities, *i.e.*, the prevention, investigation, detection, or prosecution of criminal offences (arts. 3(40) and 3(41) AI Act).
  - › Annex III submits to mandatory requirements AI systems used by law enforcement authorities “AI systems intended to be used by law enforcement authorities for predicting the occurrence or reoccurrence of an actual or potential criminal offence based on profiling of natural persons as referred to in Article 3(4) of Directive (EU) 2016/680 or *assessing personality traits and characteristics or past criminal behaviour of natural persons or groups*” (Annex III(6)(e) AI Act)
- ▶ This definition is quite close to the purpose of behavioural cartel screenings, and yet it is restricted to criminal offences

# III. Algorithmic Decision-Making Under the AI Act



- ▶ Reference to criminal offences is problematic, as competition law is qualified as criminal in some but not all Member States
  - › Full criminalisation: Ireland, Estonia, Denmark, Greece and Slovenia
  - › Criminalisation of specific competition law infringements in Luxembourg, Germany, Poland, Hungary, Austria, Italy, Belgium, Portugal and Croatia
  - › Criminalisation of competition law infringement in specific circumstances in France, Romania, Czechia and Slovakia (*caveat* Cyprus)
  - › No criminalisation in Bulgaria, Finland, Netherlands, Sweden, Malta, Lithuania, Latvia and EU competition law
- ▶ Upshot: The AI Act will only apply to competition law proceedings in legal orders that criminalise competition law
- ▶ How does this fit the objective of harmonisation?

# III. Algorithmic Decision-Making Under the AI Act



- ▶ Applying the AI Act to competition law through the backdoor? Criminal law if (ECtHR *Engel*)
  - › Classification in domestic law as a starting point (ECtHR, *Weber v. Switzerland* 1990)
  - › Nature of the offence
    - » Does the rule concern all citizens? (ECtHR, *Bendenoun v. France* 1994)
    - » Does the rule have a deterrent or punitive purpose or does it merely impose pecuniary compensation? (*Ibid*)
    - » Were the proceedings brought by a public authority under statutory powers of enforcement? (ECtHR, *Benham v. The United Kingdom* 1996)
    - » Does the rule at stake seek to protect general interests of society? (ECtHR, *Produkcija Plus Storitveni Podjetje D.O.O. v. Slovenia* 2018)
    - » Is the imposition of a penalty upon a finding of guilt? (ECtHR, *Benham v. The United Kingdom* 1996)
    - » Is the misconduct at stake classified as part of the criminal law in the vast majority of the Contracting States (ECtHR, *Öztürk v. Germany* 1984)
  - › Severity of the penalty (ECtHR, *Campbell and Fell v. The United Kingdom* 1984)
- ▶ Upshot? Competition law belongs to the criminal sphere (ECtHR, *Société Stenuit v. France* 1992; ECtHR, *Lilly France S.A. v. France* 2002; ECtHR, *A. Menarini Diagnostic S.R.L. v. Italy* 2011)



# III. Algorithmic Decision-Making Under the AI Act



## ► Within the EU

- › Competition law offences “*shall not be of criminal nature*” (Council Regulation 1/2003)
- › ECtHR *Jussila*: hard core vs peripheral criminal law
- › EU competition law is not hard core criminal law but belongs to its periphery (Bot 2010, Sharpston 2011, Kokott 2013, Wahl 2018, Bobek 2021)
- › Confirmed by the ECJ (recently, *bpost* 2022)
- › Competition law is “*criministrative*” law (Bailleux 2014)

# III. Algorithmic Decision-Making Under the AI Act



- ▶ RQ: Could the criministrative nature of competition law serve as a back-door to apply the AI Act to all competition law proceedings regardless of the domestic qualification?
- ▶ No
  - › Contextual approach: the AI Act and SWD refer to “criminal matters” in a context of hard core criminal law
  - › Coherence: “AI systems specifically intended to be used for administrative proceedings by tax and customs authorities should not be considered high-risk AI systems used by law enforcement authorities for the purposes of prevention, detection, investigation and prosecution of criminal offences” (Recital 38, *in fine*, AI Act)



## IV. Conclusion: Without Any Prejudice?

- ▶ Annex III suggests AI systems intended to be used by law enforcement authorities in the course of detection, investigation and prosecution of criminal offences raise high-risk and are subject to mandatory requirements
  - › In legal orders that qualify competition law as criminal: algorithmic screening tools would have to comply with the AI Act
  - › In legal orders that do not qualify competition law as criminal: the AI Act does not apply
  - › The AI Act closes the door to an extension of its scope of application through peripheral criminal law
- ▶ As the AI Act is a harmonising regulation, keeping different standards of protection depending on national qualification makes no sense