

Artificial Intelligence and Market Behaviour Manipulations¹

Ex-ante evaluation in the regulator's arsenal

N. de Marcellis-Warin
F. Marty
E. Thelisson
Th. Warin

2020-12-07

- 1 Research Context
- 2 Algorithms and Risks for Consumers
- 3 Algorithms and Risks for Competition
- 4 Ex-ante Supervision Mechanisms
- 5 Tools for Self-Assessment of High-Stake Decisions
- 6 Conclusion

Research Context

Algorithms and Risks for Consumers

Algorithms and Risks for Competition

Ex-ante Supervision Mechanisms

Tools for Self-Assessment of High-Stake Decisions

Conclusion

References

Appendices

Section 1

Research Context

Contributions

- 1 AI & ethics: more relevant than ever
- 2 A case for ex-ante assessment on top of ex-post
- 3 ex-ante methodology: trust indexes

Digital Economy, Competition and Consumer Protection

Misleading communication to consumers (1/2):

- State of California v Apple (November 18, 2020)

Digital Economy, Competition and Consumer Protection

Misleading communication to consumers (2/2):

- FTC v Zoom (November 9, 2020)
 - Deceptive and unfair methods related to security communication
 - Two dissents (Slaughter and Chopra):
 - Slaughter: Apparent quality is preferred over real quality, yet the consumer cannot evaluate ex post the quality of the service provided, even if the risks are major (security, privacy protection).
 - Chopra: “deception distorts competition”
 - Link between damage to the consumer and damage to competition

Research Question

What is the issue(s) we want to address?

- How to detect and remedy ex-post in the case of high-stake decisions?

Our research question:

- How to regulate practices that may violate consumer and competition protection rules and ethical values?

How to regulate practices that may violate consumer and competition protection rules and ethical values?

Ex ante procedures:

- By market supervisory authorities,
 - Digital Markets Unit UK (November 27, 2020)
- By the consumers themselves,
- By the firms themselves and their stakeholders,
 - Self-assessment tools to ensure algorithm compliance and integrity
 - Score method based on a trust index developed by AI Institute

Table of content

- Algorithms and risks for consumers
- Algorithms and risks for the competition
- Ex-ante supervision mechanisms
 - By the competition authorities
 - By the consumers themselves
- Tools for self-assessment of high-stake decisions

Section 2

Algorithms and Risks for Consumers

Algorithms and risks for consumers

Three types of damage are possible:

- ① Restriction of the space of the possible choices
- ② Manipulation of consumer behaviour
- ③ Imposition of unbalanced transaction conditions

Damage to the consumer's freedom of choice

AI as a tool for preference prediction:

- 1/3: An increasingly refined understanding (data analysis capabilities characterized by 4V; acquisitions of specialized firms Onavo (Facebook), Looker (Google)...).
- 2/3: Creating irreversibilities: shopping-then-shipping to shipping-then-shopping

Damage to the consumer's freedom of choice

- 3/3: A privileged position to encourage the adoption of new services to the detriment of competing services (Ezrachi and Stucke, 2020)
 - Knowledge (information)
 - Persuasion (personalized targeting)
 - Decision (incentives, gambling on recommendations)
 - Implementation (fluidity - interoperability)
 - Confirmation (technical help - redirection)

The manipulation of consumer behaviour

- Notion of Dark Patterns:
 - Encouraging a decision that is not in the consumer's interest: bad nudge (push)
 - Hindering decisions in the interest of consumers: bad sludge (friction)
- Exploiting consumers' cognitive biases (Thaler, 2018; Sustain, 2019)
- Sludge illustration: EPIC Games (Fortnite) complaint against Google (August, 2020)

The manipulation of consumer behaviour

- The dark pattern can result from the architecture of choice or solicitations
- It may also address issues related to the protection of personal data (Bielova and Santos, 2020).

Dark patterns

Mapping and quantification in Luguri and Strahilevitz (2019):

- High impact of mild dark patterns
- Low consumer rejection
- Failure to take into account the phenomena of progressive quality degradation

Table

Category	Variant
Nagging	
Social Proof	Activity messages, Testimonials
Obstruction	Roach Motel, Price comparison Prevention, Intermediate currency
Sneaking	Sneak into basket, Hidden costs, Hidden subscription / forced continuity, Bait & Switch

Table

Category	Variant
Interface Interference	Hidden information / aesthetic manipulation / false hierarchy, Preselection, Toying with emotions, Trick questions, Disguised Ad, Confirmshaming
Forced Action	Forced registration
Urgency	Low stock / high-demand message, Countdown timer / limited-time message

The imposition of unbalanced contractual conditions

- Personalization of prices (by deducting individual ability to pay)
- Personalization of products according to the technical capabilities of each consumer (versioning)
- Manipulation of transaction costs (price partitioning, drip pricing)
- Consumer lock-in effects

Section 3

Algorithms and Risks for Competition

Algorithms and damage to competition

- Locking of the dominant position
 - Killer Acquisitions
 - Dead zone
 - Strategic reduction of interoperability:
 - Enhanced capabilities through now casting tools
- Algorithmic collusions

A regulation of the algorithms by the algorithms

By the supervisory authorities:

- Dedicated units
 - Ex ante validation of algorithms
 - Stress tests (e.g. algorithmic collusion incubators)
 - Dark patterns detection (see GDPR)
 - Ex-post analysis: detection of abnormal market patterns
 - Comply or Explain

A regulation of the algorithms by the algorithms

By the consumers:

- Transparency and accountability of algorithms (XAI - explainable artificial intelligence)
- Dedicated platforms (INRIA)
- Use of counter-algorithms
- Privacy enhancing technologies (PET)

Section 4

Ex-ante Supervision Mechanisms

A self-assessment for algorithmic risks

- Algorithmic prediction/recommendation issues related to highly consequential decisions
 - On the consumer (freedom of choice, market opportunity... but also discrimination)
 - About the competition
- Irreversible consequences / low explicability of choices: need for specific supervision and not just an ex-post sanction.
- How to make platforms accountable?
 - Explainable AI
 - Commitments to stakeholders

Avenues for self-assessment

- Accountability from the design of the algorithms and from data collection / processing
- Biases induced by the coding itself
- Consideration of the architecture of the sites and the design of the choices
- Algorithm-specific persuasion biases (Fogg, 2003): reduction, channelling, fine tuning, suggestion, self-censorship, monitoring and conditioning
- Certification Mechanisms

Section 5

Tools for Self-Assessment of High-Stake Decisions

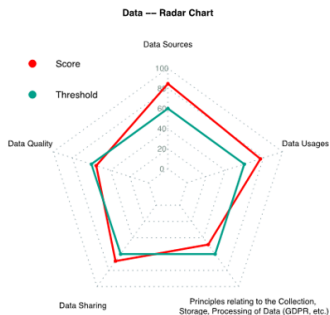
The construction of trust indexes

- Methodology (AI Transparency Institute):
 - Construction of scores on the company's performance with respect to legal and ethical criteria, data security, absence of bias in data and processing
 - Stakeholders (business partners, customers ...)
 - Internal use and shareholder accountability tool (CSR)
 - Tool for evaluating performance in relative terms (scalar graphs)

Examples

The Data – Index: 66.70

Strength: **Acceptable**

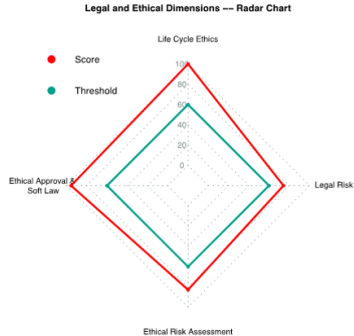


Risk Criteria	Score	Required	Strength
Data Sources	84.67	60.0	Amazing
Data Quality	54.94	60.0	Acceptable
Data Sharing	68.67	60.0	Good

Examples

Legal & Ethical – Index: 88.11

Strength: **Amazing**



Risk Criteria	Score	Required	Strength
Life Cycle Ethics	56.38	60.0	Acceptable
Ethics Approval & Soft Law	63.97	60.0	Good
Ethical Risk Assessment	77.67	60.0	Good

Examples

Analysis & Visualization

Responsible AI Index: 42.26

Strength: **Acceptable**

● Score
● Threshold

Responsible AI Index -- Radar Chart



Use case of the trust indexes

- Reputational dimension vis-à-vis stakeholders
- Integration in the financial rating of the company
- Logic for evaluating the performance of internal management
- Logic of competition by comparison
- Supporting CSR standards and norms
 - ISO 26 000
 - Art. L.225-102-1 Commercial Code
 - Law of March 27, 2017 on the duty of vigilance of parent companies

Section 6

Conclusion

Conclusion

Ex ante procedures:

- By market supervisory authorities,
- By the consumers themselves,
- By the firms themselves and their stakeholders,
 - Self-assessment tools to ensure algorithm compliance and integrity
 - Score method based on a trust index developed by AI Institute

Section 7

References

References

- Marty F. & Warin Th. “Concurrence et innovation dans les écosystèmes numériques à l’ère de l’intelligence artificielle”, *Concurrences / Competition Law Review*, Vol. 1, pp. 36-41, February 2020,
<https://www.concurrences.com/en/review/issues/no-1-2020/on-topic/digital-competition-en>
- Marty F. & Warin Th. “The use of AI by online intermediation platforms. Conciliating economic efficiency and ethical issues” (with Marty, F.), *Delphi - Interdisciplinary Review of Emerging Technologies*, Vol 2, Issue 4, pp. 217 - 225, 2019 [DOI: 10.21552/delphi/2019/4/11],
<https://doi.org/10.21552/delphi/2019/4/11>

References

- Marty F. & Warin Th. “Artificial Intelligence and Market Manipulations: Ex-ante Evaluation in the Regulator’s Arsenal” CIRANO Working Papers 2020s-64
<https://cirano.qc.ca/files/publications/2020s-64.pdf>
- Marty F. & Warin Th. “Keystone Players and Complementors: An Innovation Perspective” CIRANO Working Papers 2020s-61
<https://cirano.qc.ca/files/publications/2020s-61.pdf>

References

- Marty F. & Warin Th. “Visa Acquiring Plaid: A Tartan over a Killer Acquisition? Reflections on the risks of harming competition through the acquisition of startups within digital ecosystems” CIRANO Working Papers 2020s-62
<https://cirano.qc.ca/files/publications/2020s-62.pdf>

Section 8

Appendices

Table

Category	Variant	Description
Nagging		Repeated requests to do something firm prefers
Social Proof	Activity messages	Misleading notice about other consumers' actions
	Testimonials	Misleading statements from customers
Obstruction	Roach Motel	Asymmetry between signing up and cancelling
	Price comparison Prevention	Frustrates comparison shopping
	Intermediate currency	Purchases in virtual currency

Table

Category	Variant	Description
Sneaking	Sneak into basket	Item consumer did not add is in cart
	Hidden costs	Costs obscured / disclosed late in transaction
	Hidden subscription / forced continuity	Unanticipated / undesired automatic renewal
	Bait & Switch	Customer sold something other than what is originally advertised

Table

Category	Variant	Description
Interface Interference	Hidden information / aesthetic manipulation / false hierarchy	Important information visually obscured
	Preselection	Firm-friendly default is preselected
	Toying with emotions	Emotionally manipulative framing
	Trick questions	Intentional or obvious ambiguity
	Disguised Ad	Consumer induced to click on

Table

Category	Variant	Description
Forced Action	Forced registration	Consumer tricked into thinking registration necessary
Urgency	Low stock / high-demand message	Consumer falsely informed of limited quantities
	Countdown timer / limited-time message	Opportunity ends soon with blatant false visual cue