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**Exclusionary Choice Architecture: Behavioural Exclusion as a Demand-Side Theory of Harm
under Article 102 TFEU**

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Chapter 1: Introduction

1.1 Research problem and context

Article 102 TFEU prohibits the abuse of a dominant position.¹ EU competition law has developed categories through which potentially abusive conduct is assessed. Some focus mainly on price and cost, such as predatory pricing and margin squeeze. Others focus on product linkage, access conditions, or differential treatment, including tying, bundling, refusal to supply, and self-preferencing.² These categories provide identifiable legal and evidential markers. They may involve a relationship between price and cost, a link between two products, or a difference in the treatment of competing services within a controlled interface. In some price-based cases, authorities compare the dominant undertaking's prices and costs to assess whether an equally efficient competitor could compete effectively. This gives the analysis a measurable point of reference.³

Certain digital practices are harder to assess through these established markers. Firms have always influenced how customers encounter and compare products. Digital markets may intensify that influence because the same undertaking may compete within and control the environment through which users find and select rival offers. It can set defaults, decide what appears first, determine how visible an option is, choose how many steps a task requires, and place warnings or prompts along the way.⁴

Choice architecture describes how a decision environment organises and presents options through defaults, ordering, visibility, prompts, and the number of steps required to act.⁵ A firm

¹ Consolidated Version of the Treaty on the Functioning of the European Union [2012] OJ C326/47, art 102.

² Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings 2009 (OJ C45/7); For example, see *Microsoft Corp v Commission of the European Communities* [2007] GC Case T-201/04; *Google LLC and Alphabet Inc v European Commission* [2024] ECJ Case C-48/22 P.

³ Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (n 2) paras 23–27.

⁴ Competition and Markets Authority, 'Evidence Review of Online Choice Architecture and Consumer and Competition Harm' (Competition and Markets Authority 2022)

<<https://www.gov.uk/government/publications/online-choice-architecture-how-digital-design-can-harm-competition-and-consumers/evidence-review-of-online-choice-architecture-and-consumer-and-competition-harm>>; Friso Bostoen and Daniel Mândrescu, 'Assessing Abuse of Dominance in the Platform Economy: A Case Study of App Stores' (2020) 16 *European Competition Journal* 431

<<https://doi.org/10.1080/17441056.2020.1805698>>; N Helberger and others, 'Choice Architectures in the Digital Economy: Towards a New Understanding of Digital Vulnerability' (2022) 45 *J Consum Policy* 175 <<https://doi.org/10.1007/s10603-021-09500-5>>.

⁵ Richard H Thaler, Cass R Sunstein and John P Balz, 'Choice Architecture' (Social Science Research Network, 2 April 2010) 1–3 <<https://doi.org/10.2139/ssrn.1583509>>.

may also observe how users behave and adjust the design in response.⁶ In such markets, the conditions under which users encounter rivals are not entirely external to the dominant undertaking. They are partly shaped by its interface design.

This creates a gap between formal choice and effective choice.⁷ Users may be free, on paper, to install a rival app, change a default, or use a competing service. In practice, many may not do so because the design directs their attention and effort towards the dominant undertaking's option and away from alternatives. Rivals may then lose access to customers before users assess the quality of their offers. A simple example shows the point. A new phone may come with one search engine as the default. The user is free to change it, but doing so requires several steps that many users do not take. Even a rival that is comparable in price and quality may therefore fail to reach a substantial number of those users. The resulting disadvantage may arise from the default rather than from the relative quality of the competing services.

This thesis studies that gap through behavioural exclusion. The broader concept is anti-competitive foreclosure, which concerns conduct capable of making it more difficult for rivals to enter, expand, or remain in the market in a way that impairs effective competition.⁸ Many established foreclosure theories focus on contractual, technical, or pricing mechanisms that restrict rivals' access to inputs, distribution channels, or customers, or raise the costs of competing.⁹ This thesis uses behavioural exclusion as a proposed demand-side theory of foreclosure. It describes situations in which a dominant undertaking controls a material digital choice environment and allocates user attention or effort asymmetrically between its own offer and rival offers. The conduct works through predictable behavioural tendencies, such as inertia, default effects, and sensitivity to additional effort, and is capable of materially reducing the demand that rivals can realistically reach.¹⁰

⁶ Viktorija Morozovaite, 'Hypernudging in the Changing European Regulatory Landscape for Digital Markets' (2023) 15 Policy & Internet 78, 82–84 <<https://doi.org/10.1002/poi3.329>>; Stuart Mills, 'Finding the "Nudge" in Hypernudge' (2022) 71 Technology in Society 102117, 3–5 <<https://doi.org/10.1016/j.techsoc.2022.102117>>.

⁷ Ryan Stones, 'Behavioural Economics in EU Competition Law: Article 102 TFEU, the Digital Markets Act, and Informed Assumptions of Irrationality' [2025] J Antitrust Enforcement jnaf019 <<https://doi.org/10.1093/jaenfo/jnaf019>>; Peter O'Loughlin, 'Cognitive Foreclosure' (2022) 38 Georgia State University Law Review <<https://readingroom.law.gsu.edu/gsulr/vol38/iss4/9>>.

⁸ Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (n 2) para 19.

⁹ *ibid* 31–45, 46–62, 63–74 and 75–90; Jonathan M Jacobson, 'Exclusive Dealing, "Foreclosure," and Consumer Harm' (2002) 70 Antitrust Law Journal 311, 327.

¹⁰ Richard H Thaler, Cass R Sunstein and John P Balz, 'Choice Architecture' (Social Science Research Network, 2 April 2010) <<https://doi.org/10.2139/ssrn.1583509>>; Amos Tversky and Daniel Kahneman, 'Judgment under Uncertainty: Heuristics and Biases' (1974) 185 Science 1124; William Samuelson and Richard Zeckhauser, 'Status Quo Bias in Decision Making' (1988) 1 J Risk Uncertainty 7 <<https://doi.org/10.1007/BF00055564>>.

The difficulty is not that Article 102 is too narrow to reach such conduct.¹¹ Although established categories remain important, Article 102 is not confined to a closed list of abuses. It asks whether conduct departs from competition on the merits and is capable, in its legal and economic context, of producing exclusionary effects. That framework leaves room for demand-side harm.¹² The practical difficulty is that the categories through which Article 102 is usually applied rely on markers, such as a price-cost relationship, product linkage, or identifiable demotion, that may be absent when exclusion works through defaults, friction, and salience.¹³ The Digital Markets Act (DMA) and Digital Services Act (DSA) address parts of this problem through ex ante obligations and user-protection rules. They do not replace the case-specific Article 102 inquiry into conduct by a dominant undertaking.¹⁴ This thesis argues that Article 102 is broad enough in principle to address behavioural exclusion, but that the closest established categories do not always provide a sufficiently clear method for identifying and proving this mechanism.

1.2 Research question and sub-questions

The analysis is informed by the special responsibility of dominant undertakings not to impair genuine and undistorted competition.¹⁵ That principle does not create an independent ground

¹¹ *Konkurrensverket v TeliaSonera Sverige AB* [2011] ECJ Case C-52/09 [26].

¹² *Intel Corp v European Commission* [2017] ECJ Case C-413/14 P [138]; *Post Danmark A/S v Konkurrenserådet* [2012] ECJ Case C-209/10 [24–26]; *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* [2022] ECJ Case C-377/20 [50–53, 70–72]; *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* [2023] ECJ Case C-333/21 126–31; Heike Schweitzer and Simon de Ridder, ‘How to Fix a Failing Art. 102 TFEU: Substantive Interpretation, Evidentiary Requirements, and the Commission’s Future Guidelines on Exclusionary Abuses’ (2024) 15 *Journal of European Competition Law & Practice* 222 <<https://doi.org/10.1093/jeclap/lpae033>>.

¹³ Renato Nazzini, ‘The Evolution of the Law and Policy on Tying: A European Perspective from Classic Leveraging to the Challenges of Online Platforms’ (2018) 27 *Florida State University Journal of Transnational Law & Policy* <<https://ir.law.fsu.edu/jtlp/vol27/iss1/6>>; Daniel Mandrescu, ‘Tying and Bundling by Online Platforms – Distinguishing between Lawful Expansion Strategies and Anti-Competitive Practices’ (2021) 40 *Computer Law & Security Review* 105499 <<https://doi.org/10.1016/j.clsr.2020.105499>>; Elias Deutscher, ‘Google Shopping and the Quest for a Legal Test for Self-Preferencing Under Article 102 TFEU’ (2022) 2021 6 *European Papers - A Journal on Law and Integration* 1345 <<https://doi.org/10.15166/2499-8249/528>>; Eva Fischer, Lena Hornkohl and Nils Imgarten, ‘Discriminatory Leveraging Plus: The Standard for Independent Self-Preferencing Abuses after Google Shopping (C-48/22 P)’ (2025) 2025 10 *European Papers - A Journal on Law and Integration* 25 <<https://doi.org/10.15166/2499-8249/823>>.

¹⁴ The relationship between behavioural exclusion and the DMA and DSA is discussed in Chapter 3. Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) (Text with EEA relevance) 2022 (OJ L); Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) (Text with EEA relevance) 2022 (OJ L).

¹⁵ *NV Nederlandsche Banden Industrie Michelin tegen Commissie van de Europese Gemeenschappen* [1983] ECJ Zaak 322/81 [57].

of liability, but it is relevant where a dominant undertaking controls the conditions through which rivals reach users. The central research question is the following.

Under what conditions can a dominant undertaking's use of digital choice architecture constitute an exclusionary abuse under Article 102 TFEU, having regard to its special responsibility?

Three sub-questions structure the answer.

First, to what extent do established Article 102 tools depend on demand responding to price, quality, and innovation, and how can predictable behavioural tendencies weaken that response?

Second, to what extent can the closest established categories, particularly tying, bundling, and self-preferencing, accommodate exclusion that operates through the asymmetric allocation of attention and effort?

Third, what workable criteria can operationalise Article 102, informed by the special responsibility of dominant undertakings, without turning it into general regulation of interface design?

1.3 Academic and societal relevance

The academic relevance of the thesis is best seen against three bodies of literature. First, Article 102 scholarship has examined a wide range of exclusionary practices, including predatory pricing, margin squeeze, tying, bundling, and refusal to supply. Scholarship on the special responsibility doctrine has also clarified its scope and limits.¹⁶ Less attention has been given to mechanisms that operate through the design of user attention and effort. Recent case law, particularly *Servizio Elettrico Nazionale* and *European Superleague*, confirms that completed foreclosure need not be shown. The conduct must instead depart from competition on the merits and be capable, in its legal and economic context, of producing exclusionary effects.¹⁷ The implications of that development for behavioural, non-price mechanisms remain underdeveloped.

¹⁶ Giorgio Monti and Ekaterina Rousseva, 'The Special Responsibility of Dominant Undertakings' in Pinar Akman, Or Brook and Konstantinos Stylianou (eds), *Research handbook on abuse of dominance and monopolization* (Edward Elgar 2023) <<https://doi.org/10.4337/9781839108723.00022>>.

¹⁷ *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* (n 12) 50–53; *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* (n 12) 126–128.

Second, behavioural economics explains why users may not search, compare, or switch even when doing so would benefit them.¹⁸ Foundational work by Kahneman and Tversky¹⁹ describes bounded rationality and heuristics, while Thaler, Sunstein, and Balz²⁰ develop the concept of choice architecture. Third, a more recent literature applies these insights to competition law. Stones examines how behavioural assumptions inform Article 102 and the DMA.²¹ O'Loughlin develops cognitive foreclosure as a possible competitive mechanism but does not formulate a legal test for abuse.²² Petit and Neyrinck show that EU law can take account of consumer biases and firm conduct but do not propose a framework for exclusion through digital choice architecture.²³ Akman analyses the structure of abuse under Article 102 but leaves open how behavioural steering should be assessed.²⁴ These contributions establish important parts of the problem, but they do not converge on a structured framework linking behavioural design, foreclosure, and exclusionary capability.

A more specific gap therefore remains. Existing scholarship recognises that behavioural tendencies can affect competition, but it has not supplied a sufficiently clear and operational test for when digital choice architecture produces demand-side foreclosure under Article 102. The DMA imposes *ex ante* duties on designated gatekeepers, while the DSA regulates certain manipulative interfaces. Their different scope and legal tests leave a distinct role for Article 102.²⁵ Current debates on exclusionary abuses and self-preferencing confirm that the treatment of novel non-price conduct remains unsettled.²⁶ This thesis contributes by defining behavioural exclusion as a demand-side theory of foreclosure, identifying attention and effort as its principal pathways, developing addressable demand as the relevant foreclosure concept, and proposing cumulative criteria for assessing the conduct under Article 102. It does not claim that

¹⁸ Avishalom Tor, 'Understanding Behavioral Antitrust' (2013) 92 SSRN Electronic Journal <<https://doi.org/10.2139/ssrn.2293508>>.

¹⁹ Tversky and Kahneman (n 10).

²⁰ Thaler, Sunstein and Balz (n 5).

²¹ Stones (n 7).

²² O'Loughlin (n 7).

²³ Nicolas Petit and Norman Neyrinck, 'Behavioral Economics and Abuse of Dominance – A Fresh Look at the Article 102 TFEU Case-Law' [2010] SSRN Electronic Journal <<https://doi.org/10.2139/ssrn.1641431>>.

²⁴ Pinar Akman, 'A Critical Inquiry into "Abuse" in EU Competition Law' (2024) 44 Oxf J Leg Stud 405 <<https://doi.org/10.1093/ojls/ggae008>>.

²⁵ Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) (Text with EEA relevance); Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) (Text with EEA relevance).

²⁶ Dirk Auer and Lazar Radic, 'The Commission's Art.102 TFEU Guidelines: Consolidation or Creation?' (2025) 0 European Competition Journal 1 <<https://doi.org/10.1080/17441056.2025.2511419>>; Fischer, Hornkohl and Imgarten (n 13).

behavioural exclusion is already a settled category or that every form of behavioural steering is abusive.

The societal relevance follows from the role of digital intermediaries. A limited number of powerful firms control environments through which many users search, shop, install software, and make payments. The design of those environments can materially shape which options users notice and select, and whether rivals can compete effectively for user demand. A clear and disciplined application of Article 102 can help preserve conditions in which rival services compete on their merits. It can also give firms, authorities, courts, and private claimants a clearer basis for distinguishing aggressive but lawful design from exclusionary conduct.²⁷

1.4 Methodology and analytical framework

This thesis uses doctrinal analysis supported by behavioural and law-and-economics literature. It draws primarily on Article 102 TFEU, the case law of the Court of Justice and the General Court, and Commission decisions. Behavioural economics and choice architecture literature is used to identify the mechanisms through which interface design may affect user behaviour. The study is library-based and does not conduct empirical research of its own. Its aim is both interpretive and normative. It interprets the existing law and proposes criteria for applying it to behavioural exclusion.

The thesis adopts protection of the competitive process as its principal organising benchmark. Article 102 is concerned with competition on the merits rather than the protection of individual competitors as such. Harm to a particular rival is therefore not sufficient. The relevant question is whether the dominant undertaking uses means other than competition on the merits and whether its conduct is capable of impairing effective competition. This follows the approach confirmed in *Servizio Elettrico Nazionale*, which describes competition on the merits by reference to price, choice, quality, and innovation.²⁸

From that benchmark, the thesis applies a law-and-economics approach. It asks whether a legal rule can identify genuine demand-side foreclosure without condemning ordinary product design. This requires avoiding two mistakes. The first is condemning design that makes a service more attractive through price, quality, convenience, or innovation. The second is allowing exclusionary conduct to escape scrutiny because it does not fall within a familiar category. A workable rule must also be administrable. It should identify the mechanism of harm, explain the relevant burden of proof, and indicate the evidence that matters. For this reason, Chapter 4

²⁷ Directive 2014/104/EU of the European Parliament and of the Council of 26 November 2014 on certain rules governing actions for damages under national law for infringements of the competition law provisions of the Member States and of the European Union Text with EEA relevance 2014 (OJ L).

²⁸ *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* (n 12) paras 73–78.

uses threshold conditions and cumulative criteria rather than an unstructured case-by-case inquiry.

The framework is informed by the special responsibility of dominant undertakings. In *Michelin I*, the Court held that a dominant undertaking must not allow its conduct to impair genuine and undistorted competition²⁹, while *Hoffmann-La Roche* describes abuse as the use of methods that differ from normal competition.³⁰ Special responsibility is not a separate ground of liability and does not create a general duty to assist competitors.³¹ It informs the assessment of whether the undertaking's use of its market position and control over the interface departs from competition on the merits. It does not replace the need to establish exclusionary capability. The thesis treats the established categories of abuse as structured analytical tools that identify the likely mechanism of harm and the evidence that matters.³² The framework does not alter the established requirements of dominance or effect on trade. Control over the choice environment is a factual condition specific to the proposed analysis.

The three criteria developed in Chapter 4 are derived from the mechanism identified in Chapter 2 and the general requirements of Article 102. The first identifies how the disputed design affects user choice. For this thesis, the relevant choice architecture practices are organised into two principal pathways, attention and effort. The second asks whether that mechanism materially and asymmetrically reduces the demand that rivals can realistically reach. It draws by analogy on the logic of competitive disadvantage under Article 102(2)(c) and on the post-Google Shopping literature.³³ This analogy is an analytical proposal rather than settled doctrine. Foreclosure is assessed through addressable demand, defined as the share of demand that a rival competing on the merits could realistically reach under a plausible alternative design that removed the disputed asymmetry while preserving legitimate product functions.³⁴ The third criterion asks whether the reduction in addressable demand is capable, in its legal and economic context, of impairing the competitive process. This reflects the capability standard

²⁹ *NV Nederlandsche Banden Industrie Michelin tegen Commissie van de Europese Gemeenschappen* (n 15) para 57.

³⁰ *Hoffmann-La Roche & Co AG v Commission of the European Communities* [1979] ECJ Case 85/76 [91].

³¹ *Unilever Italia Mkt Operations Srl v Autorità Garante della Concorrenza e del Mercato* [2023] ECJ Case C-680/20 [37]; Giorgio Monti and Ekaterina Rousseva, 'The Special Responsibility of Dominant Undertakings' *Research Handbook on Abuse of Dominance and Monopolization* (Edward Elgar Publishing 2023) 247 <<https://www.elgaronline.com/edcollchap/book/9781839108723/book-part-9781839108723-22.xml>>.

³² Pablo Ibáñez Colomo, 'The Future of Article 102 TFEU after Intel' (2018) 9 *Journal of European Competition Law & Practice* 293, 296 <<https://doi.org/10.1093/jeclap/lpy023>>.

³³ Deutscher (n 13).

³⁴ The concept is developed in Chapter 2; on counterfactual reasoning in foreclosure assessment, see Nora von Ingersleben-Seip and Zlatina Georgieva, 'Old Tools for the New Economy? Counterfactual Causation in Foreclosure Assessment and Choice of Remedies on Data-Driven Markets' (2025) 13 *J Antitrust Enforcement* 328 <<https://doi.org/10.1093/jaenfo/jnae042>>.

confirmed in Servizio Elettrico Nazionale and European Superleague.³⁵ Objective justification and proportionality are then considered. These criteria are the thesis's proposed operationalisation of the general Article 102 requirements in the specific context of behavioural exclusion.³⁶ The first identifies the mechanism. The second connects it to a material competitive disadvantage not explained simply by the weakness of rival offers. Together, they help assess whether the conduct departs from competition on the merits. The third asks whether the resulting disadvantage is capable of producing exclusionary effects. The framework does not claim to be the only possible structure under Article 102. It is intended to provide a disciplined and workable method for assessing this particular mechanism.

The thesis sets limits on its claims. It does not propose a new legal basis outside Article 102, argue that behavioural exclusion is already a settled category of abuse, or make an empirical claim about any particular market. It develops a structured way of assessing a potentially exclusionary mechanism that is not yet captured by a settled Article 102 category. Generative AI was used only for permitted supportive purposes including brainstorming, feedback on the structure and presentation of the thesis, and limited grammar and style.

1.5 Structure of the thesis

Following this introduction, the thesis contains three substantive chapters and a conclusion. Chapter 2 sets out the economic and behavioural foundations. It explains why demand may not respond fully to competitive merit in digital choice environments and develops the distinction between formal and effective choice. Chapter 3 examines tying, bundling, and self-preferencing because they are the established frameworks that most closely resemble exclusion through digital choice architecture. It also considers the relationship between Article 102, the DMA, and the DSA, and argues that these frameworks provide only a partial fit. Chapter 4 develops the proposed legal framework. It identifies the threshold conditions, sets out three cumulative criteria concerning the behavioural mechanism, the reduction of rivals' addressable demand, and capability to produce exclusionary effects, and considers objective justification and proportionality. Chapter 5 answers the research question, summarises the framework, and identifies its limits.

³⁵ *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* (n 12) 50–53; *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* (n 12) 126–128.

³⁶ *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* (n 12) paras 129–30.

Chapter 2: Economic and Behavioural Foundations

This chapter develops the economic and behavioural foundations needed for the legal analysis in later chapters. It does not provide a general account of behavioural economics. Article 102 TFEU has long applied to non-price practices that can distort competition, including tying, exclusivity, leveraging, and self-preferencing.³⁷ This chapter asks a more specific question. It examines how a dominant undertaking may weaken competition by shaping how users notice, compare, and choose between rival options.³⁸

The starting point is the distinction between formal and effective choice. In digital markets, an alternative may exist in theory but remain difficult to use in practice.³⁹ Users may be able to install a rival application, change a default setting, or access a competing provider, while rivals still struggle to reach customer demand.⁴⁰ The existence of alternatives is therefore not necessarily enough to create effective competitive pressure.⁴¹ Effective competitive pressure also depends on whether users can notice, assess, and choose those alternatives without excessive effort.⁴² When a dominant undertaking controls the relevant interface, its design choices may influence whether rival options are visible and practical to use.⁴³

This argument does not treat consumers as irrational, and it does not suggest that every influence on behaviour is a competition concern.⁴⁴ Behavioural tendencies such as inertia, status quo bias, salience, framing, and sensitivity to friction matter here only when interface design may materially reduce the demand that rivals can realistically reach.⁴⁵

³⁷ See Consolidated version of the Treaty on the Functioning of the European Union 2012 (OJ C326/47) art 102; *Hoffmann-La Roche & Co AG v Commission of the European Communities* (n 30); *Microsoft Corp v Commission of the European Communities* (n 2); *Google LLC and Alphabet, Inc v European Commission* [2022] GC Case T-604/18; *Google LLC and Alphabet Inc v European Commission* (n 2).

³⁸ Ryan Stones, 'Behavioural Economics in EU Competition Law: Article 102 TFEU, the Digital Markets Act, and Informed Assumptions of Irrationality' [2025] *Journal of Antitrust Enforcement* jnaf019 <<https://doi.org/10.1093/jaenfo/jnaf019>> (discusses how Article 102 cases like Google, Microsoft, Amazon already implicitly engage with non-rational user behaviour).

³⁹ Naimy Paul, 'Smokescreens of Digital Markets—Choice Manipulation and the Illusion of Consent' (2025) 16 *Journal of European Competition Law & Practice* 208, 214, 216–217 <<https://doi.org/10.1093/jeclap/lpaf050>>.

⁴⁰ Amelia Fletcher and others, 'The Effective Use of Economics in the EU Digital Markets Act§§' (2024) 20 *Jnl of Competition Law & Economics* 1, 2–3, 13–14 <<https://doi.org/10.1093/joclec/nhad018>>; Nataliia Bielova, Cristiana Santos and Colin Gray, 'Two Worlds Apart! Closing the Gap between Regulating EU Consent and User Studies' (2024) 37 *Harvard Journal of Law & Technology* 1295, 1295–1322.

⁴¹ Maurice E Stucke, 'Behavioral Antitrust in 2026' (Social Science Research Network, 24 February 2026) 4–6 <<https://doi.org/10.2139/ssrn.6299364>>.

⁴² Amelia Fletcher and Zita Vasas, 'Implications of Behavioural Economics for the Pro-Competitive Regulation of Digital Platforms' (2024) 40 *Oxf Rev Econ Policy* 808, 809, 813–814 <<https://doi.org/10.1093/oxrep/grae044>>.

⁴³ *ibid* 813–814.

⁴⁴ Amelia Fletcher, 'The Role of Behavioural Economics in Competition Policy' (Social Science Research Network, 15 March 2023) 2–3 <<https://doi.org/10.2139/ssrn.4389681>>.

⁴⁵ O'Loughlin (n 7) 1097–1098, 1103–1105.

Section 2.1 explains demand responsiveness and why it may weaken in digital choice environments. Section 2.2 introduces the behavioural tendencies used in the analysis and considers whether a small group of attentive users can discipline the market. Section 2.3 explains how choice architecture affects attention and effort and how these effects can spread across a market. Section 2.4 brings these points together in the working concept of behavioural exclusion.

2.1 Demand Responsiveness in Selected Article 102 Tools

Several tools used under Article 102 depend, to some degree, on demand responsiveness. This means that customers are expected to move towards offers that are better on price, quality, choice, or innovation once a rival can supply them. In digital choice environments controlled by a dominant undertaking, that response may be weakened. The question is how far the operation of those tools depends on demand responding to competitive merit.

Answering that question first requires separating demand responsiveness from the frictions that the doctrine already recognises. The doctrine does not assume perfectly informed consumers. It already recognises that entry barriers, switching costs, network effects, lock-in, and information asymmetries can weaken competitive pressure.⁴⁶ Even so, some price-based tools rely on an efficient rival being able to attract enough customer demand to compete effectively. Competition on the merits performs a different role by providing the legal benchmark for distinguishing lawful success from exclusionary conduct.⁴⁷ This section explains why demand responsiveness still matters to the operation of those tools.

Where rivals can supply real alternatives, some of these tools assume that customers can redirect demand towards the more competitive offer.⁴⁸ That assumption can help distinguish lawful success from exclusionary conduct.⁴⁹ A dominant undertaking may lawfully attract users through better prices, higher quality, greater convenience, or innovation. It does not incur

⁴⁶ *Microsoft Corp v Commission of the European Communities* (n 2) paras 1060-1062, 1088; *Confédération européenne des associations d'horlogers-réparateurs (CEAHR) v European Commission* [2010] GC Case T-427/08 [95–105]; *Tetra Pak International SA v Commission of the European Communities* [1996] ECJ Case C-333/94 P [36–37].

⁴⁷ For example, see *Post Danmark A/S v Konkurrencerådet* [2015] ECJ Case C-23/14 [59–61] (The as-efficient-competitor test is not mandatory when market structures prevent new entry); *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* [2021] GC Case T-612/17 [169, 171, 371–373] (On how manipulating choice architecture undermines ‘competing on the merits’ by exploiting visual bias); *Google LLC and Alphabet, Inc v European Commission* (n 37) 428, 574 (For judicial recognition that theoretical assumptions of demand responsiveness fail against “status quo bias”).

⁴⁸ Louis Kaplow and Carl Shapiro, ‘Antitrust’ (Social Science Research Network, 1 January 2007) 2–3, 14–16 <<https://papers.ssrn.com/abstract=960442>>.

⁴⁹ Adriano Barbera, Nicolás Fajardo Acosta and Timo Klein, ‘The Role of the AEC Principle and Tests in a Dynamic and Workable Effects-Based Approach to Abuse of Dominance’ (2023) 14 *Journal of European Competition Law & Practice* 582, 13 <<https://doi.org/10.1093/jeclap/lpad057>>.

liability simply because competitors lose market share.⁵⁰ Tests based on an as-efficient rival ask whether a hypothetical rival with costs as efficient as those of the dominant undertaking could compete under the conditions created by the undertaking's conduct. They do not directly assess whether that rival can effectively reach customers.⁵¹ This thesis argues that such tests may provide an incomplete account of foreclosure where control over the choice environment limits the rival's practical access to customers. Without sufficient demand responsiveness, a favourable price-cost result may not show that the rival can compete effectively in practice.

Two sources of advantage should therefore be distinguished. The first comes from the offer itself, including its price, quality, convenience, or innovation.⁵² The second comes from control over how users encounter, assess, and choose between offers. Control-based advantages are not necessarily abusive. They may reflect legitimate integration, convenience, security, or product improvement. The distinction identifies the source of the advantage so that its legal character can be assessed separately in Chapter 4.⁵³

Competitive merit cannot always be reduced to a price-cost comparison. Such comparisons are most informative when the alleged exclusion operates through price.⁵⁴ Outside that setting, cost efficiency, product quality, and innovation may point in different directions.⁵⁵ A price-cost test may be useful when cost is the main variable,⁵⁶ but it may provide an incomplete picture when foreclosure operates through non-price conditions.⁵⁷ A rival may match the dominant undertaking's price, or offer its service without charge, and still struggle to reach demand.⁵⁸ It may offer a product capable of competing on the merits but remain difficult for users to find,⁵⁹

⁵⁰ *ibid* 3.

⁵¹ *ibid* 2.

⁵² *Intel Corp v European Commission* [2017] ECJ Case C-413/14 P [134].

⁵³ For example see *Hoffmann-La Roche & Co AG v Commission of the European Communities* [1979] ECJ Case 85/76 [91] (defining abuse as recourse to "methods different from those which condition normal competition"); *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* [2022] ECJ Case C-377/20 [47]; In the context of digital choice architecture, manipulating the platform interface falls outside the scope of normal competition. See *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* [2021] GC Case T-612/17 [176, 179–181] (ruling that such architectural manipulation constitutes an "abnormality" that deviates from competition on the merits by destroying "equality of opportunity").

⁵⁴ Miroslava Marinova, 'Competition Law in Limbo: Intel, Fidelity Rebates, and the Price of Procedural Errors' (2026) 22 *European Competition Journal* 38, s 3.3 <<https://doi.org/10.1080/17441056.2025.2499322>>.

⁵⁵ Timothy J Tardiff, 'EFFICIENCY METRICS FOR COMPETITION POLICY IN NETWORK INDUSTRIES' (2010) 6 *Jnl of Competition Law & Economics* 957 <<https://doi.org/10.1093/joclec/nhp025>>.

⁵⁶ *ibid* 970.

⁵⁷ *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* [2021] GC Case T-612/17 [538, 540] (Ruling that the as-efficient-competitor test is restricted to pricing practices, and that measuring comparative efficiency is flawed when the dominant firm has already distorted market conditions).

⁵⁸ *Microsoft Corp v Commission of the European Communities* [2007] GC Case T-201/04 [1041] (Noting that the structural advantage of pre-installation forecloses rivals even when competing products are offered at the exact same price, free of charge).

⁵⁹ *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* [2021] GC Case T-612/17 [171–172].

or innovate successfully without reaching them in a meaningful way.⁶⁰ Behavioural exclusion can therefore affect rivals that compete effectively in different ways. The mechanism depends on control over the route through which users reach alternatives, not only on the rival's cost efficiency.⁶¹

If the alleged harm lies in that path rather than in the offer, the relevant inquiry is how much demand a rival capable of competing on the merits can realistically reach. This thesis calls that concept addressable demand. The term distinguishes it from the contestable share used in Article 102 rebate analysis, which refers to the portion of an individual customer's requirements that can realistically be switched to a competitor.⁶² It is also distinct from the economic concept of a contestable market, in which the threat of entry constrains incumbent firms and sunk costs are absent or insignificant.⁶³ That is not the issue here. Addressable demand means the share of demand that a rival capable of competing on the merits could realistically reach under a plausible alternative design that removed the disputed asymmetry while preserving legitimate product functions. The concept is counterfactual.⁶⁴ It compares the demand rivals can reach under the existing design with the demand they could reach under that alternative. The relevant measure will depend on the market and may include users, transactions, usage, or revenue.

A browser example illustrates the difference between formal availability and addressable demand. A rival browser may be free and technically available, so users appear free to switch. Yet a default that favours the operating system's own browser, extra switching steps, and warning prompts may deter some users from considering or completing the switch. Demand may therefore be formally open to competition but only partly addressable. The relevant counterfactual could be a design that gives users a genuine initial choice or removes unnecessary differences in the steps required to select a rival. The question is not only whether users can choose the rival in theory. It is whether the rival can realistically reach and compete for their demand under the conditions created by the dominant undertaking's interface.

The comparison does not require an actual market that is identical in every respect except for the disputed design. Google Shopping shows that the absence of a perfectly unaffected comparator does not end the analysis, although the alleged causal link and exclusionary effects must still be supported by evidence.⁶⁵ The assessment may therefore proceed without a perfect

⁶⁰ *ibid.*

⁶¹ See Stones (n 7); O'Loughlin (n 7); Fischer, Hornkohl and Imgarten (n 13).

⁶² *Intel Corp v European Commission* [2014] GC Case T-286/09 [92–93].

⁶³ William J Baumol, John C Panzar and Robert D Willig, 'Contestable Markets: An Uprising in the Theory of Industry Structure: Reply' (1983) 73 *The American Economic Review* 491, 493–496.

⁶⁴ Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (n 2) para 21.

⁶⁵ *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* (n 47) para 377.

comparator, but it still requires evidence. The legal question is whether the conduct is capable of producing exclusionary effects, as discussed in *Servizio Elettrico Nazionale* and *European Superleague*.⁶⁶

Addressable demand does not depend on a single form of evidence. A comparator may be available in some cases. In others, the assessment may rely on behavioural data, market developments, internal documents, or other qualitative and quantitative evidence. For present purposes, behavioural exclusion requires a material difference between actual and counterfactual addressable demand. If the difference is small or absent, behavioural exclusion does not arise. This may be because the design does not materially affect user behaviour or because rival offers are less competitive on the merits.

2.2 Behavioural Economics and Bounded Rationality

Behavioural economics does not reject the demand-responsiveness premise identified in the previous section. It refines that premise by showing that users respond to price, quality, convenience, and trust under limits of time, attention, and effort. Formal access to an alternative therefore does not always lead to effective switching. At the same time, a failure to switch does not by itself show foreclosure. Users may remain with a service because they are satisfied, because it works well with other services, or because they have little interest in changing. The relevant question is whether the dominant undertaking's design is capable, in its legal and economic context, of materially reducing the demand that rivals can realistically reach. An intention to produce that effect is not required, although evidence of intention may still be relevant.⁶⁷ The focus is therefore on the design and its market effects, not on the psychological state of any individual user.

Bounded rationality provides the starting point. Users have limited time and attention, so they often rely on shortcuts when making digital choices.⁶⁸ This is not necessarily irrational. No one can compare every search engine, browser, app store, payment service, or privacy setting whenever a choice arises. Competition concern may arise when a dominant undertaking

⁶⁶ *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* (n 53) paras 50–53; *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* (n 12) paras 126–129.

⁶⁷ On the objective character of abuse and its relationship to evidential standards, see Akman, 'A Critical Inquiry into "Abuse" in EU Competition Law' (n 24) 412, 421; *Hoffmann-La Roche & Co AG v Commission of the European Communities* (n 30) para 91.

⁶⁸ Christoph Schneider, Markus Weinmann and Jan vom Brocke, 'Digital Nudging: Guiding Online User Choices through Interface Design' (2018) 61 *Commun. ACM* 67, 67–68 <<https://doi.org/10.1145/3213765>>; Richard H Thaler, Cass R Sunstein and John P Balz, 'Choice Architecture' (Social Science Research Network, 2 April 2010) 429–430 <<https://doi.org/10.2139/ssrn.1583509>>; Herbert A Simon, 'A Behavioral Model of Rational Choice' (1955) 69 *The Quarterly Journal of Economics* 99, 99–101 <<https://doi.org/10.2307/1884852>> (applying bounded rationality and heuristic decision-making specifically to digital choice environments and interface design).

controls how those choices are presented and can design the environment in ways that channel ordinary decision-making shortcuts towards its own services and make rival services less likely to be considered.⁶⁹

Status quo bias and inertia help explain why formal choice may not become effective choice in a digital setting.⁷⁰ Status quo bias concerns how users view the existing arrangement. A familiar setup may seem safer or easier, so changing it can appear costly or unnecessary even when another option may be better.⁷¹ Inertia concerns the tendency not to act even where a user has no strong preference for the existing option. That tendency may be reinforced when switching requires the user to find the settings, transfer data, grant permissions, and check that the new service works. When the benefit is uncertain, doing nothing is often easier.⁷² Apparent loyalty may therefore reflect inertia or the immediate cost of change rather than a firm preference for the incumbent service.⁷³

Friction can reinforce this passivity and make it relevant to competition. It refers here to design choices that make one action harder than another without making it impossible.⁷⁴ Examples include extra clicks, hidden menus, repeated confirmations, unclear instructions, warning messages, and less visible buttons.⁷⁵ Friction is not always harmful. Confirmation prompts can prevent accidental purchases, warnings can protect against fraud, and permission requests can support informed consent.⁷⁶ The concern arises when friction is materially asymmetric. If staying with the dominant firm's service is automatic and easy while choosing a rival requires

⁶⁹ Michelle Fang and Marcela Mattiuzzo, 'Online Choice Architecture and Behavioral Economics – The Role for Antitrust Law' (Yale University Thurman Arnold Project 2023) Paper 3 2–7.

⁷⁰ Fletcher and Vasas (n 42) 809–810.

⁷¹ Samuelson and Zeckhauser (n 10) 8–10; Daniel Kahneman, Jack L Knetsch and Richard H Thaler, 'Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias' (1991) 5 *The Journal of Economic Perspectives* 193, 197–200.

⁷² David Gal, 'A Psychological Law of Inertia and the Illusion of Lossaversion' (2006) 1 *Judgment and Decision Making* 23, 24–26 <<https://doi.org/10.1017/S1930297500000322>> Gal distinguishes inertia from status quo bias by treating inertia as a more basic tendency to remain with the status quo unless there is a sufficient psychological motive to change, rather than as merely a consequence of loss aversion or preference for the current option.

⁷³ Samuelson and Zeckhauser (n 10) 23–26 (explaining that persistence in the status quo may reflect inertia, habit, convenience, or transition costs rather than genuine preference); Alexander MacKay and Marc Remer, 'Consumer Inertia and Market Power' (Social Science Research Network, 29 January 2024) 6, 18–22 <<https://papers.ssrn.com/abstract=4912975>>.

⁷⁴ Lirio Barros and others, 'The Rise of Dark Patterns: Does Competition Law Make It Any Brighter? *Economic Focus*' (2022) 21 *Competition LJ* 136, 140 <<https://doi.org/10.4337/clj.2022.03.06>>.

⁷⁵ *ibid* 137; Mark Leiser and Cristiana Santos, 'Dark Patterns, Enforcement, and the Emerging Digital Design Acquis: Manipulation beneath the Interface' (2024) 15 *European Journal of Law and Technology* 5–10 <<https://ejlt.org/index.php/ejlt/article/view/990>>.

⁷⁶ Cass Sunstein and Julien Gosset, 'Optimal Sludge? The Price of Program Integrity' (2020) 70 *Duke Law Journal Online* 74, 75.

much more effort, the design alters the conditions under which users encounter and assess the rival rather than changing the merits of the rival's offer.⁷⁷

These points lead to a central objection to behavioural antitrust. Sceptics may accept that many users do not compare offers carefully. They argue that competition does not require every user to be attentive. A smaller group of informed users may be enough if rivals can compete for them.⁷⁸ On this view, firms must continue to offer competitive terms because losing informed and mobile users to rivals is costly. Those users may therefore discipline the firm's conduct even if many others do not actively compare offers.⁷⁹

This objection has force in the markets for which it was developed. In many offline settings, the conditions faced by attentive users are less directly controlled by a single firm. Relevant factors include the location of retailers, the information available through advertising and word of mouth, and the time needed to compare offers. A dominant firm may influence these conditions through advertising, contracts, product placement, or control over distribution. It is generally less able, however, to redesign the entire decision environment for individual users and adjust it continuously in response to their behaviour.⁸⁰ The conditions affecting the marginal group may therefore be less directly controlled by the firm whose conduct they are expected to constrain.

The same reasoning is less secure in a digital choice environment controlled by a dominant undertaking. The firm may raise the mental and practical costs of switching and make rival offers harder to find or assess.⁸¹ This changes the basis of the objection because the users expected to discipline the firm operate within an environment designed by that same firm. Three features are especially important. They concern the design of switching costs, the use of personal data, and the speed with which the interface can be adjusted. These features show what control over the architecture can make possible. They do not prove that every dominant undertaking uses that control in an exclusionary way.

⁷⁷ *Google LLC and Alphabet, Inc v European Commission* (n 37) 542–544.

⁷⁸ For the conventional view that competition may remain effective even where many consumers do not actively compare offers, because firms compete for a sufficiently informed or searching marginal group, see Steven Salop and Joseph Stiglitz, 'Bargains and Ripoffs: A Model of Monopolistically Competitive Price Dispersion' (1977) 44 *The Review of Economic Studies* 493, 500 <<https://doi.org/10.2307/2296903>> ("Every consumer need not have perfect information. If there are enough perfectly informed consumers ... the weight of their potential search keeps the market competitive"). See also; Alan Schwartz and Louis L Wilde, 'Intervening in Markets on the Basis of Imperfect Information: A Legal and Economic Analysis' [1979] *University of Pennsylvania Law Review* 638–639 <<https://doi.org/10.2307/3311617>>.

⁷⁹ Schwartz and Wilde (n 78); Salop and Stiglitz (n 78).

⁸⁰ Barros and others (n 74) 140 (contrasting offline retail constraints, such as physical shelf layout and limited experimentation, with online firms' ability to cheaply redesign, test, and personalise digital choice architecture).

⁸¹ Oxera, 'Behavioural Economics and Its Impact on Competition Policy: A Practical Assessment with Illustrative Examples from Financial Services' (The Netherlands Authority for Consumers and Markets (ACM) 2013) 21–23.

First, switching costs can be created within the interface. The dominant firm does not merely respond to costs that exist outside its conduct. It can design some of those costs directly.⁸² The steps through which users compare and choose services are therefore not always neutral features of the market. They may be choices made by the firm. The cost of comparing offers and acting on that comparison can become partly dependent on choices made by the firm.⁸³ The marginal-user argument assumes that willingness to switch is sufficiently independent of the firm being constrained. In a controlled digital environment, that independence may be weaker.

Second, personalisation may allow the firm to treat users differently. The usual argument assumes that switching costs affect users in broadly similar ways. Digital firms may be able to use behavioural data to identify users who appear more likely to switch. In principle, that capability could be used to place more friction in their path.⁸⁴ Other users might face a smoother process, while potential switchers could receive extra prompts, warnings, or delays.⁸⁵ If used in that way, personalisation could weaken the marginal group selectively and reduce its ability to discipline the market. Whether this occurs and has a material effect would require case-specific evidence.

Third, digital firms can receive feedback and adjust the interface quickly. A/B testing, retention metrics, click-through data, drop-off rates, and continuous experimentation can reveal changes in user behaviour as they occur.⁸⁶ The firm can then respond by changing the architecture, sometimes rapidly or automatically.⁸⁷ Marginal switching may therefore not only constrain the firm. It may also generate information that the firm can use to refine the same environment through which users switch.

These features do not mean that the marginal group disappears. Some users will switch under any design and will continue to exert some pressure. The point is that the size and effectiveness of that group cannot be assumed.⁸⁸ Both may depend on the interface that the dominant undertaking controls. The objection remains useful in markets where the conditions of search

⁸² H Tai Lam, 'Platform Search Design and Market Power' (University of California, Los Angeles 2022) 12–18 <https://www.anderson.ucla.edu/sites/default/files/document/2021-09/Lam_JMP_Platform_Search_Design.pdf>; Fletcher and Vasas (n 42) 809.

⁸³ Lam (n 82) 12–18; Fletcher and Vasas (n 42) 809.

⁸⁴ Morozovaite, 'Hypernudging in the Changing European Regulatory Landscape for Digital Markets' (n 6) 82–84; Mills (n 6) 3–5.

⁸⁵ Henrik Skaug Sætra, 'When Nudge Comes to Shove: Liberty and Nudging in the Era of Big Data' (2019) 59 *Technology in Society* 101130, 1–3 <<https://doi.org/10.1016/j.techsoc.2019.04.006>>.

⁸⁶ Competition and Markets Authority (CMA), 'Online Choice Architecture: How Digital Design Can Harm Competition and Consumers' (Competition and Markets Authority 2022) CMA155 para 1.16–1.17 <https://assets.publishing.service.gov.uk/media/624c27c68fa8f527710aaf58/Online_choice_architecture_discussion_paper.pdf>; Ron Kohavi and Stefan Thomke, 'THE SURPRISING POWER OF ONLINE EXPERIMENTS: GETTING THE MOST OUT OF A/B AND OTHER CONTROLLED TESTS.' (2017) 95 *Harvard Business Review* 74, 3–5.

⁸⁷ Morozovaite, 'Hypernudging in the Changing European Regulatory Landscape for Digital Markets' (n 6) 82–84.

⁸⁸ Competition and Markets Authority (CMA) (n 86) para 1.20–1.24.

and switching are largely independent of the firm. It becomes weaker where the same firm can shape those conditions. In that setting, the marginal group may still constrain the firm, but its ability to do so must be shown rather than presumed.

Moving from individual behaviour to market effects still requires case-specific evidence. A generic feature of digital design does not by itself establish behavioural exclusion. The analysis must show that the design affects user behaviour in a way that materially reduces the demand rivals can realistically reach. This section has explained why the marginal-user objection cannot settle that question on its own.

2.3 Choice Architecture: Attention and Effort Pathways

As noted earlier, choice architecture refers to how a digital interface organises the way users find, compare, choose, or reject available options.⁸⁹ It includes visual design, the sequence of steps, the information shown, the timing of prompts, and technical settings that shape a decision.⁹⁰ Section 2.2 explained that users often rely on defaults, familiar options, and the easiest available path. Control over the interface may channel those ordinary tendencies towards one route rather than another. This section examines two principal pathways through which that can occur. Commission decisions and Court judgments are used as illustrations, even where they do not use the terminology developed here.

The analysis uses two pathways, attention and effort. For present purposes, attention covers both which options users notice and how those options are presented for consideration. Effort concerns the burden of acting on an option after it has been noticed. Warnings, defaults, rankings, social proof, urgency cues, and similar tools may operate through one or both pathways rather than forming separate categories.

The literature does not use a single taxonomy. The OECD identifies twenty-four dark commercial patterns across seven categories.⁹¹ The UK Competition and Markets Authority uses three categories covering twenty-one practices.⁹² Münscher, Vetter and Scheuerle identify nine techniques within three broader categories.⁹³ The Michie taxonomies are broader and address behaviour-change interventions generally, with twenty-six techniques in one version and ninety-three in another.⁹⁴ The variation reflects a basic methodological difficulty. One technique may

⁸⁹ Thaler, Sunstein and Balz (n 5) 1–3.

⁹⁰ Helberger and others (n 4) 2–3, 12–13.

⁹¹ OECD, 'Dark Commercial Patterns' [2022] OECD Digital Economy Papers 9–10, 53 <<https://doi.org/10.1787/44f5e846-en>>.

⁹² Competition and Markets Authority (CMA) (n 86) tbls 2, 3, 4.

⁹³ Robert Münscher, Max Vetter and Thomas Scheuerle, 'A Review and Taxonomy of Choice Architecture Techniques' (2016) 29 *Journal of Behavioral Decision Making* 511, 514 <<https://doi.org/10.1002/bdm.1897>>.

⁹⁴ Charles Abraham and Susan Michie, 'A Taxonomy of Behavior Change Techniques Used in Interventions' (2008) 27 *Health Psychology* 379, tbl 1 <<https://doi.org/10.1037/0278-6133.27.3.379>>; Susan Michie and others, 'The

work through several cognitive mechanisms, while the same mechanism may support different techniques.⁹⁵ A taxonomy must therefore decide whether to organise the field by visible technique or underlying process.

The CMA framework is the most useful starting point because it was developed by a competition authority for competition analysis.⁹⁶ This thesis reorganises the practices most relevant to competitive access into two principal pathways. Rankings, framing, and visual prominence often operate mainly through attention.⁹⁷ Extra steps, hidden settings, and switching burdens often operate mainly through effort.⁹⁸ Defaults and warnings may operate through both. For this framework, attention includes how an option is presented for consideration as well as whether it is noticed. Personalisation can strengthen either pathway.⁹⁹

This framework does not cover every form of online manipulation. It focuses on design that changes how users encounter competing options and may therefore affect rivals' access to demand. Practices such as drip pricing and reference pricing fall outside the present analysis unless they alter how users compare competing routes or materially reduce the demand rivals can reach. The same applies to practices affecting a single purchase without changing competitive access to demand. Three questions define the scope. First, does the design create an asymmetry between competing routes? Second, does that asymmetry affect how users notice, assess, or act on rival options? Third, can the resulting effect reduce rivals' addressable demand? These are analytical questions, not a complete legal test.

Attention and effort are analytically distinct but often work together. A default may make the incumbent option more visible and easier to continue using while requiring users to take extra steps to reach a rival.¹⁰⁰ When a dominant undertaking's service is set as the default, users may continue with it without actively comparing alternatives. This can occur with a search engine, browser, or payment method. The advantage comes from asymmetry. Staying with the default requires no action, while choosing a rival requires extra steps and overcoming inertia.¹⁰¹ The

Behavior Change Technique Taxonomy (v1) of 93 Hierarchically Clustered Techniques: Building an International Consensus for the Reporting of Behavior Change Interventions' (2013) 46 Ann Behav Med 81, 90 <<https://doi.org/10.1007/s12160-013-9486-6>>.

⁹⁵ Münscher, Vetter and Scheuerle (n 93) 512.

⁹⁶ Competition and Markets Authority (CMA) (n 86) para 3.1.

⁹⁷ *ibid* 1, 2, 3.

⁹⁸ *ibid*.

⁹⁹ *ibid*.

¹⁰⁰ Jon M Jachimowicz and others, 'When and Why Defaults Influence Decisions: A Meta-Analysis of Default Effects' (2019) 3 Behavioural Public Policy 159, 172 <<https://doi.org/10.1017/bpp.2018.43>>; Eric J Johnson and Daniel Goldstein, 'Do Defaults Save Lives?' (2003) 302 Science 1338, 1338–39 <<https://doi.org/10.1126/science.1091721>>.

¹⁰¹ See for example Erik Hovenkamp, 'The Competitive Effects of Search Engine Defaults' (Social Science Research Network, 14 June 2024) 1–3 <<https://doi.org/10.2139/ssrn.4647211>>, explaining that default search-engine

distinction is therefore practical. It identifies how the design works without treating the pathways as mutually exclusive.

Attention allocation concerns what users notice, consider, and compare. Users have limited time and attention and often follow familiar or easy routes. A competing service may exist in the interface but receive little attention if it is buried in a menu, shown less prominently, placed away from the decision point, or offered only after the user has continued along the incumbent's route.¹⁰²

Two mechanisms shape this pathway. Salience affects which options users notice first.¹⁰³ Framing affects how users assess an option once they notice it.¹⁰⁴ A rival may be visible but presented through wording or visual cues that make it appear less safe, compatible, or trustworthy.¹⁰⁵ It may instead be described neutrally but remain difficult to notice because another option is more prominent.¹⁰⁶ The distinction matters because salience and framing may require different evidence.

The concern is not simply that one option is more noticeable than another. Every interface must organise choices, and organisation alone is not foreclosure.¹⁰⁷ A competition concern may arise when a dominant undertaking favours its own route in a way that materially reduces rivals' addressable demand. This may occur by capturing attention at the decision point, delaying the appearance of rivals, or presenting them as less safe or less normal than the undertaking's own option. Attention asymmetry is therefore a possible mechanism through which choice architecture can reduce rivals' access to demand. Its legal assessment remains separate.

In Google Android, the Commission found that pre-installing Google Search and Chrome, together with the conditions attached to the Play Store, reinforced status quo bias and contributed to lower uptake of rival services.¹⁰⁸ The General Court accepted that pre-installation

arrangements can be sticky and may cause users who would otherwise choose rivals to remain with the pre-selected service.

¹⁰² Jan Trzaskowski, 'Persuasion, Manipulation, Choice Architecture and Dark Patterns' *Research Handbook on EU Internet Law* (Edward Elgar Publishing 2023) 318–320, 326–327

<<https://www.elgaronline.com/edcollchap/book/9781803920887/book-part-9781803920887-25.xml>>.

¹⁰³ Pedro Bordalo, Nicola Gennaioli and Andrei Shleifer, 'Salience and Consumer Choice' (2013) 121 *Journal of Political Economy* 803, 803–805 <<https://doi.org/10.1086/673885>>.

¹⁰⁴ Irwin P Levin, Sandra L Schneider and Gary J Gaeth, 'All Frames Are Not Created Equal: A Typology and Critical Analysis of Framing Effects' (1998) 76 *Organizational Behavior and Human Decision Processes* 149, 158–160 <<https://doi.org/10.1006/obhd.1998.2804>>.

¹⁰⁵ Information Commissioner's Office and Competition and Markets Authority, 'Harmful Design in Digital Markets: How Online Choice Architecture Practices Can Undermine Consumer Choice and Control over Personal Information' (Digital Regulation Cooperation Forum (DRCF) 2023) Joint Position Paper 18.

¹⁰⁶ AMELIA FLETCHER, 'CHOICE ARCHITECTURE FOR END USERS IN THE DMA' 5 <https://catalogobiblioteca.cnmc.es/DOEX/BRDOEX000014824/BRDOEX000014824_G2/Texto completo.PDF>.

¹⁰⁷ Competition and Markets Authority (CMA) (n 86) para 4.38.

¹⁰⁸ *Google Android* [2018] European Commission AT.40099 781–782.

can influence user behaviour beyond mere convenience.¹⁰⁹ The case illustrates how pre-installation and defaults can affect both the options users consider and the services they continue to use.

Google Shopping illustrates the attention pathway more directly. Google's own comparison shopping service received prominent positioning and display, while rival services were demoted and appeared lower in a less noticeable format.¹¹⁰ The Court of Justice confirmed that this combination, in its market context, departed from competition on the merits.¹¹¹ The case shows how unequal presentation can redirect attention and traffic.

Framing may operate through warning screens, compatibility wording, security prompts, trust cues, recommendation labels, and visual signals that make a rival appear less normal or less safe.¹¹² Users may see the alternative but assess it against an uneven baseline of trust, legitimacy, or security. Apple's anti-steering rules provide a related example of restricted information rather than framing in the narrow sense. Developers were restricted from informing users about payment options outside the App Store.¹¹³ The conduct involved contractual limits on communication as well as the presentation of alternatives.¹¹⁴ It therefore illustrates how restrictions on information can make rival payment routes less immediate and harder to assess.¹¹⁵

Effort allocation concerns the cognitive, procedural, or practical burden placed on users after they notice a rival option. It may involve extra clicks, hidden settings, repeated confirmations, unclear instructions, account-transfer barriers, unequal permission prompts, or difficult data transfers.¹¹⁶ These burdens may reinforce inertia and effort avoidance because users can give more weight to immediate costs than uncertain future benefits.¹¹⁷ Not every difference in effort

¹⁰⁹ *Google LLC and Alphabet, Inc v European Commission* (n 37) 567, 583.

¹¹⁰ Competition and Markets Authority (CMA) (n 86) para 4.38-4.41.

¹¹¹ *Google LLC and Alphabet Inc v European Commission* (n 2) paras 157–158, 172, 186–187.

¹¹² Amos Tversky and Daniel Kahneman, 'The Framing of Decisions and the Psychology of Choice' (1981) 211 *Science* 453, 456 <<https://doi.org/10.1126/science.7455683>>; Levin, Schneider and Gaeth (n 104) 146–166.

¹¹³ *Apple - App Store Practices (music streaming)* [2024] European Commission Case AT.40437, C(2024) 1307 final Commission Decision [184].

¹¹⁴ *ibid* 172–178.

¹¹⁵ *ibid* 180, 789.

¹¹⁶ Bielova, Santos and Gray (n 40) 1317–20, explaining unequal paths to decline, additional clicks, and added steps as forms of obstruction in consent interfaces; Leiser and Santos (n 75) 8–12, identifying obstructive refusal and withdrawal mechanisms, hidden settings, unclear information, and account-cancellation obstacles; Oxera (n 81) 21–25, discussing firms' ability to raise search and switching costs through complexity, defaults and cancellation burdens.

¹¹⁷ Oxera (n 81) 21–22; Baskaran Balasingham and Alessia D'Amico, 'Beyond Exclusion: Revisiting Exploitative Abuses in Digital Platform Markets' (2025) 13 *Journal of Antitrust Enforcement* 265, 280 <<https://doi.org/10.1093/jaenfo/jnae050>>, noting that switching costs may be high where consumers are locked into a platform and that active increases in switching costs may indicate abusive conduct.

is problematic. Extra steps may protect security, privacy, consent, or product integrity. The concern is an unjustified asymmetry that makes the dominant undertaking's route easy while making the rival route materially harder.

Such asymmetry can reduce addressable demand even where the rival's price and quality remain unchanged. Users may remain with the incumbent even where a rival can compete effectively on price, quality, or innovation because adopting it requires more effort. In that situation, design, rather than the merits of the offers alone, may shape where demand goes.

The Microsoft Internet Explorer commitments illustrate the effort pathway. The Commission's preliminary concern was that tying Internet Explorer to Windows burdened users who wanted a rival browser because they had to find, download, and install it.¹¹⁸ The commitments, which did not contain an infringement finding, introduced a browser-choice screen intended to make alternatives easier to select and install.¹¹⁹ The matter therefore illustrates how procedural effort may contribute to foreclosure without making effort a separate doctrinal test.

Commentary on the Google Shopping remedy provides a related example. It has argued that greater visibility did not necessarily translate into meaningful traffic for rival comparison shopping services.¹²⁰ This suggests that visibility alone may not create effective access to demand. A rival may be noticed while the burden of acting on that option still limits the demand it can realistically reach.¹²¹

A further feature cuts across both pathways. A dominant undertaking may use behavioural data, A/B testing, click-through rates, drop-off data, and retention metrics to observe where users continue, hesitate, or abandon a switch. This may allow it to identify design changes associated with lower switching and, in principle, vary visibility or effort across users.¹²² The process is iterative. User behaviour produces data, the data informs changes to the interface, and those changes shape later behaviour.

At its most intensive, this process resembles what Yeung calls hypernudging, which is personalised and adaptive choice architecture continuously adjusted through behavioural feedback.¹²³ When the architecture is dynamic and responsive, the gap between formal and

¹¹⁸ Microsoft Corporation, 'Commitments in Case No. COMP/C-3/39.530 — Microsoft (Tying)' para 7.

¹¹⁹ *ibid* 7–9, 15.

¹²⁰ 'Considerations for Effective Search Competition Remedies' (*Knight-Georgetown Institute*, 4 November 2024) 4–15 <<https://kgi.georgetown.edu/research-and-commentary/considerations-for-effective-search-competition-remedies/>>.

¹²¹ Lauren E Willis, 'Consumer-Facing Competition Remedies: Lessons from Consumer Law for Competition Law' (Social Science Research Network, 1 April 2023) 4, 11 <<https://papers.ssrn.com/abstract=4429654>>.

¹²² Viktorija Morozovaite, 'Commercial Hypernudging in Digital Markets: Should We Worry about Consumer Choice?' (ASCOLA Conference Paper Series, June 2020) 5–6, 12–14.

¹²³ Karen Yeung, "'Hypernudge': Big Data as a Mode of Regulation by Design' (2017) 20 *Information, Communication & Society* 118, 118, 122 <<https://doi.org/10.1080/1369118X.2016.1186713>>.

effective choice is not fixed. It may change in response to the same switching behaviour expected to discipline the dominant undertaking.¹²⁴ The firm may then use that behaviour to refine the design in ways that reduce rivals' access to demand.

2.4 Defining Behavioural Exclusion

This section brings the preceding analysis together in a working concept of behavioural exclusion. One distinction is needed because it determines how the concept relates to Article 102. Behavioural exclusion is used here as a theory of harm, not as a separate category of abuse. A category of abuse is a recognised doctrinal framework used to assess a recurring form of conduct.¹²⁵ A theory of harm performs a different task. It identifies the economic mechanism through which conduct may produce foreclosure.¹²⁶

Legal categories and theories of harm may overlap, but they are not the same. One category may accommodate different theories of harm, while the same theory may arise across several categories. In established categories, the case law provides analytical conditions through which the conduct and its exclusionary capability can be assessed.¹²⁷ The underlying mechanism may therefore require less separate explanation than it would for novel conduct, but the applicable conditions of Article 102 must still be satisfied.

The absence of an established category does not prevent a theory of harm from explaining how conduct may restrict competition. Modern case law requires an assessment of whether the conduct is capable of producing exclusionary effects.¹²⁸ A theory of harm may therefore operate within an existing category, across several categories, or under the general framework of Article 102 where no established category provides a complete fit.

This thesis does not use behavioural exclusion to describe a category already recognised by the EU courts. The conduct may be examined through established categories, but the demand-side mechanism described here is not itself a settled legal category. Behavioural exclusion is

¹²⁴ *ibid* 122.

¹²⁵ Richard Whish and David Bailey, '5. Article 102' in Richard Whish and David Bailey (eds), *Competition Law* (Oxford University Press 2021) 203, 210–211, 221 <<https://doi.org/10.1093/he/9780198836322.003.0005>>.

¹²⁶ *ibid* 213, 221–22.

¹²⁷ Pablo Ibáñez Colomo, 'Beyond the “More Economics-Based Approach”: A Legal Perspective on Article 102 TFEU Case Law' (2016) 53 *Common Market Law Review* 709, 714, 724–25 <<https://kluwerlawonline.com/api/Product/CitationPDFURL?file=Journals\COLA\COLA2016062.pdf>> Colomo observes that EU courts do not apply a uniform effects-based test to all exclusionary conduct. Instead, mirroring the by object framework of Article 101 TFEU, certain practices are deemed abusive by their very nature. In these instances, the courts bypass the need for a separate economic demonstration of harm, noting that establishing the anti-competitive object and the anti-competitive effect 'are one and the same thing.'

¹²⁸ For a comprehensive analysis of this jurisprudential evolution and the rejection of a formal by object dichotomy under Article 102, see Akman, 'A Critical Inquiry into "Abuse" in EU Competition Law' (n 24) 414–15, 418–21.

therefore presented as a defined mechanism through which Article 102 can assess the conduct, not as a freestanding abuse.

For this thesis, behavioural exclusion is a demand-side theory of foreclosure. It arises where a dominant undertaking controls a digital choice environment that is material to rivals' access to demand and the design allocates user attention or effort asymmetrically between its own offer and rival offers. Different treatment is not enough. The design must work through predictable behavioural tendencies and be capable of materially reducing the demand that rivals can realistically reach.

Two qualifications limit the definition. The first prevents every interface asymmetry from being treated as behavioural exclusion. The second prevents the definition from deciding whether the conduct is abusive.

First, the evidence must support a material actual or likely reduction in addressable demand. If the existing design and a plausible alternative would produce little or no meaningful difference in the demand rivals can reach, behavioural exclusion should not be inferred. This may be because the design does not materially affect user behaviour or because rivals are less attractive on the merits.

Second, the definition identifies the mechanism under examination rather than its legal treatment. It distinguishes an advantage created principally by the conditions through which users reach an offer from one created by the merits of the offer itself. Article 102 must still determine whether the conduct departs from competition on the merits and is capable, in its legal and economic context, of producing exclusionary effects. If those requirements are established, the undertaking may still demonstrate an objective justification or sufficient efficiencies.

Chapter 3: Behavioural Exclusion and the Limits of Existing Legal Frameworks

This chapter examines whether the established categories of abuse under Article 102 TFEU provide an adequate doctrinal fit for exclusion that operates through digital choice architecture. The question is not whether Article 102 can in principle address non-price exclusion. Recent case law shows that it is not limited to completed foreclosure, price-cost tests, or a closed list of legal categories.¹²⁹ The narrower question is whether the categories ordinarily used under

¹²⁹ See *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* [2022] ECJ Case C-377/20 [50-58,71–72]; *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* [2023] ECJ Case C-333/21 [126–131]

Article 102 can coherently capture practices that exclude rivals mainly by shaping how users make decisions.

This distinction matters because Article 102 analysis often proceeds through recognised categories.¹³⁰ Even within an effects-based framework, courts and authorities often use those categories as analytical starting points.¹³¹ They identify the mechanism of harm, structure the evidence, and indicate the relevant competitive benchmark. Tying focuses on product linkage, cases described as self-preferencing concern unequal treatment that favours the dominant undertaking's own offer, and rebates focus on pricing conditions and customer incentives capable of foreclosing competitors.¹³² Effects-based reasoning has therefore made the categories more contextual rather than removing them.¹³³

The central claim of this chapter is that some forms of behavioural exclusion sit uneasily within these categories. Where a dominant undertaking steers users through defaults, interface salience, switching friction, or choice-path design, the effect may be economically significant even though the conduct lacks the features on which existing doctrine usually relies.¹³⁴ There may be no recognisable tying condition, price-based inducement, exclusivity condition, or clear act of comparative demotion. This creates a risk of under-enforcement if conduct capable of weakening competition cannot be classified coherently.¹³⁵ Treating every such practice as tying or self-preferencing creates the opposite risk by stretching those categories beyond the logic that makes them workable. Akman used similar language when examining attempts to fit the Google Search conduct within established categories.¹³⁶

(defining abuse as conduct that departs from normal competition and harms the competitive process); *Post Danmark A/S v Konkurrencerådet* [2015] ECJ Case C-23/14 [57, 61, 67, 69, 74] (showing that this assessment is not tied to strict or predefined tests); *Google LLC and Alphabet, Inc v European Commission* [2022] GC Case T-604/18 81–84 (confirming that Article 102 TFEU is not limited to fixed legal categories, such as refusal to supply).

¹³⁰ Pablo Ibáñez Colomo, 'The (Second) Modernisation of Article 102 TFEU: Reconciling Effective Enforcement, Legal Certainty and Meaningful Judicial Review' (2023) 14 *Journal of European Competition Law & Practice* 608, 612–613 <<https://doi.org/10.1093/jeclap/lpad064>> (categorisation of practices as one of the four moving parts of Article 102 analysis; contrast between "unstructured case-by-case" and "structured case-by-case" approaches).

¹³¹ *ibid* 620 (structured tests versus unstructured assessment of anticompetitive effects).

¹³² See Consolidated version of the Treaty on the Functioning of the European Union 2012 (OJ C326/47) (for tying, bundling and rebates); *Google LLC and Alphabet, Inc v European Commission* [2022] GC Case T-604/18 [168] (for self-preferencing).

¹³³ *Intel Corp v European Commission* (n 12) 133–140; Schweitzer and de Ridder (n 12).

¹³⁴ Competition and Markets Authority (CMA) (n 86) para 4.24.

¹³⁵ See Stones (n 7).

¹³⁶ Pinar Akman, 'The Theory of Abuse in Google Search: A Positive and Normative Assessment Under EU Competition Law' (Social Science Research Network, 19 July 2016) 355 <<https://doi.org/10.2139/ssrn.2811789>> (arguing that forcing digital conduct into established categories like tying or discrimination "raises fundamental problems for the case law" and risks "seriously disrupting the existing parameters of these abuses," thereby breaching legal certainty). Akman ultimately concludes at 370 that attempting to fit such conduct into traditional frameworks is "equivalent to fitting a square peg in a round hole."

Section 3.1 explains why modern effects-based and capability-oriented case law leaves room for behavioural exclusion. This chapter does not survey every Article 102 category. Sections 3.2 and 3.3 focus on tying, bundling, and self-preferencing because they most closely resemble exclusion through choice architecture. Section 3.4 explains why the DMA and the DSA do not remove the Article 102 question. Section 3.5 brings the argument together and identifies the resulting doctrinal gap.

3.1 The Effects-Based Approach and the Capability Standard

Over the last two decades, Article 102 case law has increasingly emphasised a contextual assessment of whether exclusionary conduct is capable of impairing competition.¹³⁷ This development is often linked to the Commission's 2009 Guidance, but the Guidance reflects enforcement policy rather than binding judicial doctrine.¹³⁸ It gives an important role to price-cost analysis and the ability of an as-efficient competitor to compete in some price-based cases. The Court, however, has never treated the as-efficient-competitor test as a universal requirement for every form of abuse.¹³⁹

This matters for the present thesis. If Article 102 were limited to price-cost analysis or a closed list of recognised practices, behavioural exclusion through choice architecture would fall outside its reach. That is not the law. In the context of loyalty rebates, Intel held that where an undertaking submits evidence that its conduct was not capable of restricting competition, the Commission must assess all relevant circumstances, including the results of an as-efficient-competitor test where the Commission relied on that test.¹⁴⁰ The judgment requires a contextual assessment in that setting. Post Danmark I and Post Danmark II likewise show that pricing conduct must be assessed in its legal and economic context and by reference to its actual or potential exclusionary effects.¹⁴¹

Within this framework, capability plays a central role. Article 102 does not require proof that foreclosure has already fully materialised. The conduct must be capable, in its legal and economic context, of producing exclusionary effects.¹⁴² Servizio Elettrico Nazionale confirms

¹³⁷ Directorate-General for Competition (European Commission) and others, *A Dynamic and Workable Effects-Based Approach to Abuse of Dominance* (Publications Office of the European Union 2023) 2 <<https://data.europa.eu/doi/10.2763/731952>>.

¹³⁸ Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (n 2) para 3; The Commission has published Draft Guidelines on exclusionary abuses under Article 102 TFEU. Since they remain draft soft-law guidance, not binding judicial doctrine, this thesis acknowledges them only as background to the Commission's current enforcement-policy direction and does not rely on them as a legal basis; see Auer and Radic (n 26).

¹³⁹ Ibáñez Colomo, 'The Future of Article 102 TFEU after Intel' (n 32).

¹⁴⁰ *Intel Corp v European Commission* (n 12) paras 138–140.

¹⁴¹ *Post Danmark A/S v Konkurrencerådet* (n 12) para 24, 26, 30; *Post Danmark A/S v Konkurrencerådet* (n 47) para 50, 57, 61.

¹⁴² *Intel Corp v European Commission* (n 12) para 138; *Post Danmark A/S v Konkurrencerådet* (n 47) para 66.

that a competition authority need not wait until the market has already been foreclosed before intervening.¹⁴³ European Superleague arose in a different setting but supports the same general point. Capability is not a complete legal test. The conduct must also depart from competition on the merits, subject to any objective justification or efficiencies.¹⁴⁴

The capability standard does not permit speculation. Conduct is not abusive merely because it influences market outcomes. The alleged effects must be supported by specific analysis and evidence relating to the conduct and its legal and economic context.¹⁴⁵ The assessment is prospective, but it still requires evidence. This matters because behavioural steering may appear too indirect or too dependent on user psychology to raise a competition concern.¹⁴⁶ Yet if interface design materially reduces rivals' practical ability to attract demand and is capable of weakening competitive pressure, the absence of a price-cost benchmark does not place it outside Article 102.¹⁴⁷

That conclusion resolves only the threshold issue. It shows that Article 102 is not limited to price-based or completed forms of exclusion. It does not show that existing categories fit every exclusionary mechanism. The capability standard asks whether the conduct is capable of producing exclusionary effects. It does not explain how a non-traditional mechanism should be analysed. This remains important because Article 102 analysis often relies on conduct-specific markers, such as a product link, exclusivity condition, price-cost relationship, refusal of access, or act of unequal treatment.¹⁴⁸

An effects-based approach does not make doctrinal fit irrelevant. Existing categories provide structure, but they need not be the only source of it. Without a clear analytical framework, the assessment may become too formal by demanding elements that are absent in behavioural cases, or too open-ended by relying on intuition about user influence.¹⁴⁹ Modern case law therefore leaves room for the proposed theory of behavioural exclusion but does not provide a settled framework specifically directed at that mechanism.

¹⁴³ *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* (n 12) para 71,72.

¹⁴⁴ *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* (n 12) paras 126–131.

¹⁴⁵ *Schweitzer and de Ridder* (n 12); *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* (n 12) para 70.

¹⁴⁶ See Roger Van den Bergh, 'BEHAVIORAL ANTITRUST: NOT READY FOR THE MAIN STAGE' (2013) 9 *Jnl of Competition Law & Economics* 203 <<https://doi.org/10.1093/joclec/nhs042>>; Peter O'Loughlin, 'The Limits of Behavioral Antitrust' (2023) 52 *University of Baltimore Law Review* <<https://scholarworks.law.ubalt.edu/ublr/vol52/iss2/2>>.

¹⁴⁷ *Google LLC and Alphabet, Inc v European Commission* (n 37) para 538.

¹⁴⁸ Pinar Akman, 'A Critical Inquiry into "Abuse" in EU Competition Law' (2024) 44 *Oxf J Leg Stud* 405, 406 and 412 <<https://doi.org/10.1093/ojls/gqae008>>; Ibáñez Colomo, 'The (Second) Modernisation of Article 102 TFEU' (n 130) 612–613 and 620.

¹⁴⁹ Ibáñez Colomo, 'The (Second) Modernisation of Article 102 TFEU' (n 130) 620–622.

3.2 Tying, Bundling, and the Limits of Non-Coercive Defaults

Article 102(2)(d) TFEU identifies as a possible abuse the making of contracts subject to supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of those contracts.¹⁵⁰ This provision is the doctrinal starting point for abusive tying. Bundling has developed through case law and decisional practice as a closely related form of leveraging.¹⁵¹ Both concern the use of dominance over one product to distort competition involving another by linking their acquisition or use.

The Commission's 2009 Guidance sets out the conditions it considers when prioritising tying cases: distinct products, dominance in the tying market, conduct capable of foreclosure, and a requirement or inducement causing customers to obtain the tied product with the tying product.¹⁵² In pure bundling, products are supplied only together. In mixed bundling, they remain available separately, but pricing or other conditions favour joint acquisition.¹⁵³ The law is therefore not limited to express contractual compulsion, although an identifiable linkage remains necessary.

This flexibility is visible in digital cases. Formal freedom to choose a rival does not rule out foreclosure where the dominant undertaking creates conditions that materially distort competition.¹⁵⁴ In *Microsoft*, the General Court upheld the finding that tying Windows Media Player to Windows was abusive even though users could obtain rival media players.¹⁵⁵ The relevant linkage arose because Microsoft supplied Windows only with its own player and integrated it in a way that gave it a widespread distributional advantage.

Google Android followed a similar logic. The Commission found two abusive tying arrangements under the Mobile Application Distribution Agreements. Access to the Play Store was conditional on manufacturers pre-installing Google Search, while access to the Play Store and Google Search was conditional on pre-installing Chrome.¹⁵⁶ The Commission found the conduct capable of foreclosing rivals partly because pre-installation reinforces status quo bias: users tend to keep and use applications already present on their devices and rarely download competing ones.¹⁵⁷ The General Court upheld the tying findings, annulled the finding concerning portfolio-based Revenue Share Agreements, and reduced the fine.¹⁵⁸

¹⁵⁰ Consolidated version of the Treaty on the Functioning of the European Union art 102(2)(d).

¹⁵¹ See Nazzini (n 13).

¹⁵² Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (n 2) paras 48–62.

¹⁵³ *ibid* 55–62.

¹⁵⁴ See Mandrescu (n 13).

¹⁵⁵ *Microsoft Corp v Commission of the European Communities* (n 2) para 1041, 1050, 1052.

¹⁵⁶ *Google Android* (n 108) paras 764–773, 887–897.

¹⁵⁷ *ibid* 781–783, 810–813.

¹⁵⁸ *Google LLC and Alphabet, Inc v European Commission* (n 37) paras 800–801, 1099.

These cases show that tying is not limited to express contractual compulsion. Formal freedom to switch is not decisive. Still, behavioural influence was not an independent basis of liability. The cases involved identifiable forms of product linkage, including contractual conditionality, pre-installation, and technical integration.¹⁵⁹ Behavioural effects helped explain foreclosure, but did not replace the need to identify that link.

Purely behavioural design sits less comfortably within the category. Consider a platform that makes its own service the default but does not make access to one distinct product conditional on accepting another, technically integrate the products, prevent removal, or use pricing to induce joint acquisition. Users remain formally free to choose alternatives. Yet switching may require extra steps, overcoming a salience disadvantage, and responding to repeated prompts.¹⁶⁰ Rivals may then have less practical access to demand because the interface makes the incumbent route easiest to follow.¹⁶¹ The mechanism, however, is not product linkage in the ordinary sense.

Tying doctrine then faces two risks. It may exclude conduct that produces effects resembling tying but lacks a recognisable product link. It may also lose coherence if extended to every design that makes one option easier to retain. Without an identifiable relationship between products, it becomes difficult to define the limits of tying or distinguish it from a general rule against influencing user choice.

The main counterargument is that digital defaults are a modern form of tying and should be treated as functionally equivalent. The argument has force because defaults can produce similar effects, especially where they exploit status quo bias and weaken effective switching. Microsoft and Google Android show that the law takes such effects seriously. They do not establish that default-induced inertia is enough on its own. In Microsoft, the behavioural effect operated through pre-installation and technical integration. In Google Android, it operated through contractual pre-installation conditions under the Mobile Application Distribution Agreements.¹⁶² Behavioural influence strengthened an identifiable link rather than serving as the independent basis of liability.

The problem is therefore not that tying and bundling cannot accommodate behavioural evidence. They remain organised around an identifiable relationship between products, while

¹⁵⁹ Richard Whish and David Bailey, '17. Abuse of Dominance (1): Non-Pricing Practices' in Richard Whish and David Bailey (eds), *Competition Law* (Oxford University Press 2024) 778–780 <<https://doi.org/10.1093/he/9780198906032.003.0017>>; Qian Wu and Niels J Philipsen, 'The Law and Economics of Tying in Digital Platforms: Comparing Tencent and Android' (2023) 19 *Journal of Competition Law & Economics* 103 <<https://doi.org/10.1093/joclec/nhac011>>.

¹⁶⁰ Competition and Markets Authority (n 4) s 21 OCA Practices.

¹⁶¹ *ibid* Effectiveness of OCA practices.

¹⁶² *Google LLC and Alphabet, Inc v European Commission* (n 37) paras 291-292, 626-628; *Microsoft Corp v Commission of the European Communities* (n 2) paras 956–963.

purely behavioural steering may impair competition without a stable form of linkage. Where exclusion operates through the unequal allocation of effort within a digital choice environment, tying provides only a partial analytical fit.

3.3 Self-Preferencing and the Unequal Allocation of Attention and Effort

Self-preferencing has become an important descriptive framework for assessing certain forms of exclusionary conduct in digital platform markets. Its clearest doctrinal expression is Google Shopping, where the General Court upheld the finding that Google favoured its own comparison shopping service through preferential positioning and display while rival services were demoted in search results.¹⁶³ The abuse did not rest on a general duty of equal treatment. It arose from Google's control over a key intermediation interface and its use of that control to direct traffic towards its own service and away from rivals.¹⁶⁴ The Court of Justice later confirmed that favourable treatment of a dominant undertaking's own service is not inherently abusive. The conduct must be assessed to determine whether, in its market context, it departs from competition on the merits and is capable of producing exclusionary effects.¹⁶⁵

Self-preferencing analysis is therefore relational. It compares how the dominant undertaking treats its own service with how it treats competing services. A comparative disadvantage may arise through ranking demotion, different display conditions, reduced visibility, or exclusion from valuable interface space.¹⁶⁶ Fischer, Hornkohl and Imgarten describe the emerging approach as 'discriminatory leveraging plus': an identifiable discriminatory disadvantage combined with additional circumstances showing exclusionary leveraging.¹⁶⁷ The framework fits most clearly where a dual-role platform controls an interface and places competing services at a demonstrable disadvantage.

Not all behavioural exclusion involves a discrete act of demotion or suppression. It may arise cumulatively where a dominant undertaking makes its own service the path of least resistance within a digital choice environment.¹⁶⁸ Defaults, sequencing, menu depth, repeated confirmation prompts, and selective salience can produce this result.¹⁶⁹ A broad view of self-

¹⁶³ *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* (n 47) para 168,170-173.

¹⁶⁴ *ibid* 176–184, 240–246.

¹⁶⁵ *Google LLC and Alphabet Inc v European Commission* (n 2) paras 157–174.

¹⁶⁶ See Carlo F Petrucci, 'Self-Preferencing in the EU: A Legal and Policy Analysis of the Google Shopping Case and the Digital Markets Act' (2023) 22 *Competition Law Journal* 18 <<https://doi.org/10.4337/clj.2023.01.03>>; Deutscher (n 13).

¹⁶⁷ Eva Fischer, Lena Hornkohl and Nils Imgarten, 'Discriminatory Leveraging Plus: The Standard for Independent Self-Preferencing Abuses after Google Shopping (C-48/22 P)' (2025) 2025 10 *European Papers - A Journal on Law and Integration* 25 <<https://doi.org/10.15166/2499-8249/823>>.

¹⁶⁸ Competition and Markets Authority (n 4) s 21 OCA Practices.

¹⁶⁹ Stones (n 7); Brett Frischmann and Moshe Vardi, 'Better Digital Contracts with Prosocial Friction-in-Design' (2025) 65 *Jurimetrics Journal* 1.

preferencing may capture some of these practices, but the fit is less certain where no distinct comparative act can be identified.

Google Shopping and a hypothetical default illustrate the difference. In Google Shopping, demoting signals applied to rival comparison shopping services while Google's own service was exempt.¹⁷⁰ The authority could identify the algorithm, compare the treatment of the services, and trace the diversion of traffic. By contrast, a platform may set its own service as the default and place the settings needed to change it behind hidden menus and repeated confirmations. No single rival needs to be demoted. The advantage comes from the baseline and the cumulative effort required to leave it. A broad self-preferencing theory may still view this as favouring the platform's own service. The difficulty is that the comparator, the relevant act, and the causal contribution of each design choice are less distinct.

This distinction matters for the scope of self-preferencing. Google Shopping involved an identifiable comparative disadvantage. Where the comparator is less clear, the doctrine loses analytical precision. Extending it to every friction-based design would risk treating ordinary product design as abusive whenever one route is easier than another. An identifiable comparative mechanism therefore helps preserve the distinction between competition on the merits and exclusionary leveraging.¹⁷¹

A possible counterargument is that behavioural exclusion through the unequal allocation of attention or effort is simply a subtler form of self-preferencing.¹⁷² In a broad sense, this is correct because a platform that designs an interface around its preferred pathway advantages its own service. That intuition is not enough for legal analysis. A useful doctrinal category must identify the mechanism of harm and provide manageable criteria. If self-preferencing covered every design that made one option easier to retain or select, it would lose its analytical distinctiveness and approach a general prohibition on influencing user choice.

A further limitation concerns market structure. The paradigmatic self-preferencing case involves an undertaking that controls an intermediation layer and competes with businesses using that layer. Behavioural exclusion may arise in that setting, but it does not depend on it. A dominant undertaking may shape switching within its own interface even where the conduct does not fit a

¹⁷⁰ *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* (n 47) paras 440–537.

¹⁷¹ See Petrucci (n 166); Deutscher (n 13).

¹⁷² Viktorija Morozovaite, 'The Future of Anticompetitive Self-Preferencing: Analysis of Hypernudging by Voice Assistants under Article 102 TFEU' (2023) 19 *European Competition Journal* 410 <<https://doi.org/10.1080/17441056.2023.2200623>>; 'Online Choice Architecture and Compliance with The...' (*Compass Lexecon*) <<https://www.compasslexecon.com/insights/publications/online-choice-architecture-and-compliance-with-the-dma-insights-from-behavioural-economics>>.

conventional dual-role platform structure. In such cases, the harm operates through the baseline choice environment rather than side-by-side differential treatment.¹⁷³

Self-preferencing remains relevant because it recognises that control over an interface can be used to exclude rivals. It fits most clearly where the conduct involves identifiable promotion, demotion, or unequal treatment. Where the alleged exclusion results from cumulative defaults, friction, and salience, the comparator and causal act may be harder to isolate. The category therefore provides only a partial fit for the wider behavioural mechanism.

3.4 The DMA, the DSA, and the Continuing Role of Article 102 TFEU

Sections 3.2 and 3.3 examined the Article 102 categories most closely connected to choice architecture, namely tying, bundling, and self-preferencing. They showed that those categories may not fully capture behavioural demand-side exclusion. One response is that this gap matters less because the DMA and the DSA already address defaults, switching costs, steering restrictions, self-preferencing, and manipulative interfaces. That response has force, but it does not resolve the Article 102 question.

Behavioural exclusion, the DMA, and the DSA may address the same design feature, but the regimes perform different legal functions.¹⁷⁴ The DMA asks whether a designated gatekeeper has complied with specific ex ante obligations.¹⁷⁵ The DSA asks whether an online platform has designed, organised, or operated its interface in a way that deceives or manipulates users, or otherwise materially distorts or impairs their ability to make free and informed decisions.¹⁷⁶ Article 102 asks whether a dominant undertaking has engaged in conduct that departs from competition on the merits and is capable, in its legal and economic context, of producing exclusionary effects.¹⁷⁷

¹⁷³ Fischer, Hornkohl and Imgarten (n 167).

¹⁷⁴ Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) (Text with EEA relevance) para 10 (clarifying that the DMA pursues an objective that is 'complementary to, but different from' Articles 101 and 102 TFEU, focusing on contestability and fairness independently of actual or presumed market effects); Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) (Text with EEA relevance) para 134 (Digital Services Act) [2022] OJ L 277/1, Recital 134 (explicitly providing for cross-cutting cooperation between the European Board for Digital Services and Union bodies responsible for competition law when assessing digital platform interfaces).

¹⁷⁵ Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) (Text with EEA relevance) 2022 (OJ L) 3, 5, 6.

¹⁷⁶ Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) (Text with EEA relevance) para 67.

¹⁷⁷ *Hoffmann-La Roche & Co AG v Commission of the European Communities* (n 30) para 91.

The DMA is the more competition-focused of the two instruments. Several provisions address the mechanisms discussed in section 2.3. Article 5(7) prevents gatekeepers from requiring the use of specified identification, browser-engine, or payment-related services in connection with core platform services. Article 6(3) requires, in defined cases, easy uninstallation, changes to certain defaults, and choice prompts. Article 6(5) addresses favourable treatment in ranking and the related indexing and crawling of a gatekeeper's own services. Article 6(6) protects the ability to switch between and subscribe to different apps and services accessed through the core platform service.¹⁷⁸ Together, these provisions are relevant to defaults, switching, multi-homing, the presentation of alternatives, and access to users.

The DMA also has mechanisms that allow it to adapt. Article 8 allows the Commission to specify measures needed for effective compliance. Article 12 permits some obligations to be updated where the relevant conditions are met. Article 13 prevents circumvention, including through behavioural techniques or interface design. Market investigations address designation, systematic non-compliance, and possible updates to the DMA's scope or obligations.¹⁷⁹ The DMA should therefore not be treated as rigid or inattentive to behavioural design. Even so, it remains based on gatekeeper designation and specific obligations rather than a general abuse-of-dominance standard.

A first difference concerns personal scope. Gatekeeper status under the DMA does not establish dominance under Article 102.¹⁸⁰ An undertaking that has not been designated, or whose relevant service is not designated, may nevertheless be dominant under Article 102. This may include a firm below the quantitative presumptions, although Article 3(8) permits designation below them following a market investigation.¹⁸¹ Network effects, switching costs, data advantages, installed base, or single-homing may give it market power. Where rivals depend on the interface to reach users, the undertaking may control salience, friction, or trust cues in ways that reduce rivals' addressable demand. Such cases may fall outside the DMA while remaining within Article 102. The reverse is also possible. A gatekeeper may face DMA obligations for a service in which it is not dominant under Article 102.¹⁸² The regimes therefore identify undertakings through different legal tests.

A second difference concerns legal conditions. The DMA imposes specified obligations on designated gatekeepers, while Article 102 requires a conduct-specific assessment of dominance

¹⁷⁸ Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) (Text with EEA relevance) arts 5, 6.

¹⁷⁹ *ibid* 12–13, 16–19.

¹⁸⁰ *ibid* 5 (recital).

¹⁸¹ Will Leslie and others, 'Same, Same but Different? Defining Gatekeepers under the Digital Markets Act' [2026] *Journal of European Competition Law & Practice* lpag007, 1 <<https://doi.org/10.1093/jeclap/lpag007>>.

¹⁸² *ibid* 9–10.

and abuse.¹⁸³ The same friction design may be benign in a fragmented market but exclusionary where a dominant undertaking controls the gateway through which rivals reach users. Its legal character may depend on dominance, switching barriers, network effects, user behaviour, rival dependence, and the plausible counterfactual. As section 2.1 explained, that counterfactual is a less exclusionary design that preserves legitimate product functions while removing the disputed asymmetry.¹⁸⁴ DMA compliance does not generally depend on the same demonstration of dominance, departure from competition on the merits, and exclusionary capability required under Article 102.¹⁸⁵

Article 13 is broad but does not close every gap. It can prevent a gatekeeper from undermining a specific DMA obligation through interface design or behavioural techniques.¹⁸⁶ It may therefore capture combinations of small design choices where they undermine effective compliance.¹⁸⁷ Its limit is that it remains tied to obligations in Articles 5, 6, and 7 rather than operating as an independent prohibition of exclusionary choice architecture.¹⁸⁸

The DMA itself preserves this complementarity. Article 1(6) confirms that the Regulation does not exclude the application of Articles 101 and 102 TFEU.¹⁸⁹ A DMA designation is not a finding of dominance, a DMA breach is not automatically an Article 102 abuse, and DMA compliance does not create immunity from Article 102. Findings made under the DMA may provide relevant factual evidence, although their significance under Article 102 must be assessed independently. The regimes complement rather than replace one another.

The DSA addresses a different concern. Article 25(1) prohibits online platforms from designing, organising, or operating interfaces in ways that deceive or manipulate users or otherwise materially distort or impair their ability to make free and informed decisions.¹⁹⁰ Recital 67

¹⁸³ Veerle Peters and Małgorzata Kozak, 'Double Jeopardy of Article 102 TFEU and the DMA – the Challenges of a Multi-Level Enforcement System' (2025) 21 *Utrecht Law Review* 96, 101 <<https://doi.org/10.36633/ulr.1165>>.

¹⁸⁴ von Ingersleben-Seip and Georgieva (n 34) 329–340.

¹⁸⁵ Václav Šmejkal, 'ABUSE OF DOMINANCE AND THE DMA - DIFFERING OBJECTIVES OR PREVAILING CONTINUITY?' (2023) 69 *Acta Universitatis Carolinae Iuridica* 33, 34, 47 <<https://doi.org/10.14712/23366478.2023.13>>.

¹⁸⁶ Amelia Fletcher, 'Choice Architecture for End Users in the DMA' (Centre on Regulation in Europe (CERRE) 2023) Issue Paper 12.

¹⁸⁷ *ibid.*

¹⁸⁸ Jens-Uwe Franck and Martin Peitz, 'The Digital Markets Act and the Whack-A-Mole Challenge' (2024) 61 *Common Market Law Review* <<https://kluwerlawonline.com/api/Product/CitationPDFURL?file=Journals\COLA\COLA2024024.pdf>> Article 13 does not function as a general ban on exclusionary choice architecture or complex behavioural steering that cannot be clearly mapped onto one of the DMA's defined obligations (see especially 9 and 12).

¹⁸⁹ Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) (Text with EEA relevance) art 1(6).

¹⁹⁰ Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) (Text with EEA relevance) art 25.

identifies dark patterns as a target.¹⁹¹ The DSA therefore confirms that interface design can distort user choice, but it does not answer the Article 102 question.

Behavioural exclusion should not be equated with dark-pattern manipulation. A design need not involve deception to raise an Article 102 concern. It may preserve formal choice while giving the dominant undertaking's own services greater salience, lower friction, more favourable defaults, or stronger trust cues than those available to rivals.¹⁹² Users may remain informed and formally free to choose while demand is channelled towards the dominant undertaking.¹⁹³ The competition concern is therefore the diversion of demand and the weakening of rivals as competitive constraints, not necessarily defective user choice.¹⁹⁴ Article 25 DSA may cover some of these designs, but it does not require dominance, market definition, a departure from competition on the merits, or likely exclusionary effects.¹⁹⁵ The exclusion in Article 25(2) does not affect the independent application of Article 102 where a dominant undertaking's design is capable of weakening competition.¹⁹⁶

The legal interests also differ. Article 25 DSA is principally concerned with protecting recipients' free and informed decisions against deceptive, manipulative, or materially distortive interface design.¹⁹⁷ Article 102 protects the competitive process rather than rivals as such.¹⁹⁸ The competition question is not merely whether an interface influences users. It is whether a dominant undertaking's design is capable of weakening the competitive constraints sustained by rivals' access to demand.

The three regimes therefore perform different roles. The DMA addresses structurally risky practices by designated gatekeepers through specified obligations. The DSA addresses deceptive, manipulative, or materially distortive interface design from the perspective of users'

¹⁹¹ *ibid* 67 (recital).

¹⁹² Stones (n 7) 8–12.

¹⁹³ *ibid* 12.

¹⁹⁴ O'Loughlin (n 7) 1165–1166.

¹⁹⁵ Sanju Ahuja and others, 'Towards Key Contributing Factors in Identifying Dark Pattern Autonomy Violations under the EU Digital Services Act' *Companion Publication of the 2025 ACM Designing Interactive Systems Conference* (2025) 501–505 <<https://doi.org/10.1145/3715668.3736336>> (conceptualizing Article 25 DSA through autonomy violations including, deception, manipulation, and distortion of free and informed decision-making, rather than through concepts associated with Article 102 such as dominance or exclusionary effects).

¹⁹⁶ Cristiana Santos, Viktorija Morozovaite and Silvia De Conca, 'No Harm No Foul: How Harms Caused by Dark Patterns Are Conceptualised and Tackled under EU Data Protection, Consumer and Competition Laws' (2025) 34 *Information & Communications Technology Law* 329, 361–362 <<https://doi.org/10.1080/13600834.2025.2461958>>.

¹⁹⁷ Fabien Lechevalier and Marie Potel Saville, 'Fairness by Design: Combatting Deceptive AI-Driven Interfaces' (2025) 1 *Cambridge Forum on AI: Law and Governance* e31, 1–3 <<https://doi.org/10.1017/cfl.2025.10018>>.

¹⁹⁸ The objectives of competition law are contested; for present purposes, the relevant organising idea is competition as a process. See John Flynn, 'Antitrust Policy and the Concept of a Competitive Process' (1990) 35 *NYLS Law Review* 893.

free and informed decisions. Article 102 addresses exclusionary conduct by dominant undertakings where that conduct departs from competition on the merits and is capable of weakening the competitive process. The regimes may overlap in practice, but they do not replace one another.

EU law has not ignored digital choice architecture. The problem is that neither the Article 102 categories examined here nor the DMA or DSA supplies the specific Article 102 framework needed to determine when behavioural steering by a dominant undertaking becomes exclusionary abuse. Chapter 4 develops the criteria for that assessment.

3.5 The Doctrinal Gap

The preceding sections reveal a consistent problem. The established categories of abuse under Article 102 have proved adaptable in digital markets. They remain organised, however, around particular markers that make foreclosure legally identifiable. In tying and bundling, those markers include an identifiable product link, contractual or technical conditionality, integration, or pricing conditions that encourage joint acquisition. In self-preferencing, they include comparative disadvantage and differential treatment within a controlled interface. These markers make the doctrines structured and administrable.

Behavioural demand-side exclusion may operate without those markers. A dominant undertaking can weaken rivals' access to demand by configuring defaults, sequencing choices, increasing the effort required to switch, or making alternatives less salient while leaving formal choice intact. The mechanism lies in the architecture of decision-making rather than a contractual condition, identifiable product link, or discrete act of comparative demotion. The conduct may therefore weaken the competitive process without fitting the evidential markers around which existing doctrine is organised.

This creates two related difficulties. The first concerns classification. If the conduct is neither tying in the ordinary sense nor self-preferencing in its established relational form, no established conduct-specific template provides a complete starting point for the analysis. The second concerns operationalisation. Even if the conduct is placed within an existing category by analogy, the framework may remain unstable because its criteria were developed for a different mechanism. Courts then risk either formalism by demanding linkage or comparative demotion that is absent, or indeterminacy by treating interface influence alone as sufficient without a disciplined test.

The conclusion is narrow. The argument is not that every design choice that increases friction is abusive. Nor is it that Article 102 requires a new freestanding form of liability for behavioural manipulation. The substantive threshold and safeguards against overreach are addressed later in the thesis. The conclusion here is only that the categories examined in this chapter do not

fully fit exclusion that operates mainly through behavioural steering of demand. This supports the need for a more tailored analytical framework within Article 102.

The same conclusion follows even if effects-based reasoning already allows the Court or the Commission to condemn such conduct where the applicable Article 102 conditions are supported by sufficient evidence. That may be true in principle. The analysis should not, however, depend on ad hoc intuition at the edges of existing doctrine. A principled approach requires criteria that identify the mechanism of harm on its own terms rather than through imperfect analogy with doctrines developed for different forms of exclusion.

The gap identified here is therefore not a gap in the substantive scope of Article 102. It is an analytical gap in the frameworks used to apply that scope. Modern case law leaves room for behavioural harms, but traditional categories remain tied to markers that may be absent where exclusion works through friction, inertia, defaults, and salience. Recognising that mismatch prepares the next step of the thesis, which develops a more tailored analysis of behavioural exclusion under Article 102.

Chapter 4: Operationalising Behavioural Exclusion

Chapter 3 showed that some forms of behavioural exclusion do not fit easily within established Article 102 categories. Article 102 is not limited to price-based conduct, coercion, or completed foreclosure. Modern case law asks whether conduct departs from competition on the merits and is capable, in context, of producing exclusionary effects. The difficulty is that established categories rely on recognisable mechanisms. Tying focuses on product linkage, while self-preferencing fits most clearly where a dominant undertaking imposes a comparative disadvantage within an interface it controls. They fit less well where exclusion operates through how users encounter and act on choices.

Behavioural exclusion operates through a different mechanism. As Chapter 2 explained, it may arise where a dominant undertaking controls a choice environment material to rivals' access to demand and the design allocates attention or effort asymmetrically between its own offer and rival offers. Users may remain formally free to choose alternatives, yet the rival route may be less visible, more complex, or more effortful. The design may therefore reduce the demand that rivals can realistically reach.

This chapter develops a framework for assessing that conduct under Article 102. It does not create a new legal basis or treat behavioural exclusion as a settled category of abuse. It asks how the general Article 102 framework can assess a demand-side mechanism for which established categories provide only a partial fit.

The framework operates within the general Article 102 analysis and is informed by the special responsibility of dominant undertakings. That doctrine is neither an independent prohibition nor a substitute for proving abuse.¹⁹⁹ It helps explain why conduct must be assessed in light of dominance and control over an important route to users. A dominant undertaking may compete within the market while shaping the conditions in which users encounter competition. The concern is not interface design itself, but an unjustified attention or effort asymmetry capable of materially reducing rivals' addressable demand.

An analytical gap matters even when Article 102 has sufficient substantive scope. Competition law relies on structured frameworks to identify the mechanism of harm, relevant evidence, and limits of liability. Without that structure, harmful conduct may escape because it lacks a familiar label, while ordinary design may be condemned on intuition alone. The task is to develop a framework that captures the mechanism without turning Article 102 into general interface regulation.

The framework operates within Article 102's ordinary requirements, including dominance, attribution, and an effect on trade. Its threshold conditions identify when the proposed analysis is relevant, including control over a choice environment material to rivals' access to demand. The substantive criteria connect the mechanism developed in Chapter 2 to competition on the merits and exclusionary capability. Objective necessity and efficiency justifications follow the ordinary Article 102 structure. Section 4.1 explains that basis. Sections 4.2 and 4.3 develop the threshold conditions and substantive criteria. Sections 4.4 and 4.5 address justification, evidence, counterfactual analysis, and boundaries. Section 4.6 presents the decision tree.

4.1 The Special Responsibility Principle and Its Doctrinal Role

The framework draws on the special-responsibility principle recognised in Article 102 case law. In *Michelin I*, the Court held that a dominant undertaking must not allow its conduct to impair genuine, undistorted competition.²⁰⁰ This reflects *Hoffmann-La Roche*, which defined abuse by reference to methods different from normal competition.²⁰¹ Later judgments have repeated the same principle.²⁰²

¹⁹⁹ *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* (n 12) para 128.

²⁰⁰ *NV Nederlandsche Banden Industrie Michelin tegen Commissie van de Europese Gemeenschappen* (n 15) para 57.

²⁰¹ *Hoffmann-La Roche & Co AG v Commission of the European Communities* (n 30) para 91.

²⁰² *Tetra Pak International SA v Commission of the European Communities* (n 46) para 24; *Post Danmark A/S v Konkurrencerådet* (n 12) paras 21–24; *Intel Corp v European Commission* (n 12) 135–136; *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* (n 12) 44–47; *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* (n 12) 126–129.

Special responsibility must be used carefully. It is not a separate condition of liability. Article 102 still requires dominance, abuse, and an effect on trade between Member States.²⁰³ Nor does it require a dominant undertaking to protect competitors from competition on the merits.²⁰⁴ It informs the contextual application of the ordinary Article 102 test. Liability still depends on whether conduct departs from competition on the merits and is capable of producing exclusionary effects.²⁰⁵ Conduct lawful for a non-dominant firm may therefore have different consequences when carried out by a dominant undertaking.

This is relevant to digital choice architecture because a dominant undertaking may control both its product and the setting through which users find competing offers.²⁰⁶ It can therefore shape decision paths before users compare price, quality, privacy, or innovation.²⁰⁷ Article 102 does not impose a general duty to design a neutral interface or give rivals equal prominence.²⁰⁸ The concern arises where an unjustified design asymmetry materially restricts the demand rivals can reach for reasons unrelated to the merits of the offers.

The open structure of Article 102 allows this inquiry but also requires discipline. The examples in Article 102(2) are not exhaustive.²⁰⁹ Even so, Article 102 usually applies through conduct-specific analytical structures.²¹⁰ For this thesis, an analytical proxy is an observable feature that gives practical shape to the general inquiry without establishing liability.²¹¹ It identifies the likely foreclosure mechanism, benchmark, and relevant evidence. It can also organise evidential analysis and help control the risks of false positives and false negatives.²¹²

Behavioural exclusion requires the same discipline. A separate framework is justified only if the conduct involves a distinct mechanism that can be assessed through workable criteria. Chapter

²⁰³ Consolidated version of the Treaty on the Functioning of the European Union art 102.

²⁰⁴ *Unilever Italia Mkt Operations Srl v Autorità Garante della Concorrenza e del Mercato* [2023] ECJ Case C-680/20 [37]; Giorgio Monti and Ekaterina Rousseva, 'The Special Responsibility of Dominant Undertakings' *Research Handbook on Abuse of Dominance and Monopolization* (Edward Elgar Publishing 2023) 247 <<https://www.elgaronline.com/edcollchap/book/9781839108723/book-part-9781839108723-22.xml>>.

²⁰⁵ *Google LLC and Alphabet Inc v European Commission* (n 2) 163, 170.

²⁰⁶ Bostoen and Mândrescu (n 4) 435–438, 448 (using app stores as an example of how a dominant platform can control the infrastructure and interface through which users find and choose rival products.).

²⁰⁷ N Helberger and others, 'Choice Architectures in the Digital Economy: Towards a New Understanding of Digital Vulnerability' (2022) 45 J Consum Policy 175, 186–87 <<https://doi.org/10.1007/s10603-021-09500-5>>.

²⁰⁸ Inge Graef, 'Differentiated Treatment in Platform-to-Business Relations: EU Competition Law and Economic Dependence' (2019) 38 Yearbook of European Law 448, 457–458 <<https://doi.org/10.1093/yel/yez008>>.

²⁰⁹ *Europemballage Corporation and Continental Can Company Inc v Commission of the European Communities* [1973] ECJ Case 6-72 [26]; *Konkurrensverket v TeliaSonera Sverige AB* (n 11) para 26.

²¹⁰ Ibáñez Colomo, 'The (Second) Modernisation of Article 102 TFEU' (n 130) 613–14.

²¹¹ Ibáñez Colomo, 'The Future of Article 102 TFEU after Intel' (n 32) 296, 301–303 (Colomo treats Intel's factors as proxies for assessing capability, not as independent sources of liability).

²¹² Andrew Gavil and Steven Salop, 'Probability, Presumptions and Evidentiary Burdens in Antitrust Analysis: Revitalizing the Rule of Reason for Exclusionary Conduct' [2020] Georgetown Law Faculty Publications and Other Works 16–19 <<https://scholarship.law.georgetown.edu/facpub/2218>>.

2 identified that mechanism as the asymmetric allocation of attention or effort in a controlled choice environment. The proposed criteria draw on that mechanism and operate within Article 102's ordinary requirements of dominance, attribution, competition on the merits, exclusionary capability, objective justification, and effect on trade.

Google Shopping supports this methodological point, within limits. It is not authority for an open-ended abuse test. Before the EU Courts ruled, Colomo described the case as a grey area because the Commission did not frame Google's control over traffic as a refusal to supply. It focused instead on the favourable design of Google's own comparison-shopping results and the disadvantage imposed on rivals.²¹³ The final judgment shows that Article 102 can address a platform-specific foreclosure mechanism without forcing it into an inherited category. It does not make every form of behavioural exclusion self-preferencing.

This chapter therefore develops a limited operational framework. The threshold conditions identify when it applies. The substantive criteria ask whether the design uses a competition-relevant behavioural mechanism, materially reduces rivals' addressable demand, departs from competition on the merits, and is capable of producing exclusionary effects. This sequence identifies the source of the criteria and prevents an open-ended basis for liability.

4.2 Threshold Conditions

Dominance does not make every interface design choice an Article 102 issue. Digital interfaces necessarily organise information, set defaults, and make some actions easier than others.²¹⁴ Treating every influence as suspect would turn Article 102 into general supervision of interface design.²¹⁵ Dominant undertakings must remain free to improve their services and compete on the merits.

The framework uses three threshold conditions. Dominance is an ordinary Article 102 requirement. Control and materiality are screening conditions for this framework. Dominance connects the inquiry to market power, control to the ability to shape the choice environment, and materiality to its importance for rivals' access to demand. These conditions do not establish abuse or replace the later substantive assessment.

²¹³ Pablo Ibáñez Colomo, 'Indispensability and Abuse of Dominance: From Commercial Solvents to Slovak Telekom and Google Shopping' (2019) 10 *Journal of European Competition Law & Practice* 532, 540–545 <<https://doi.org/10.1093/jeclap/lpz077>> (treating Google Shopping as a “grey area” case and analysing it as a platform-specific foreclosure mechanism that did not fit neatly within traditional refusal-to-deal categories); *Google LLC and Alphabet Inc v European Commission* (n 2) 81–82, 175.

²¹⁴ Will Leggett, 'The Politics of Behaviour Change: Nudge, Neoliberalism and the State' (2014) 42 *Policy & Politics* 3, 5–6 <<https://doi.org/10.1332/030557312X655576>>.

²¹⁵ Deutscher (n 13) 1360.

The first condition is dominance, assessed under the ordinary Article 102 test in a properly defined relevant market.²¹⁶ The framework does not redefine or relax that requirement. DMA gatekeeper status cannot replace dominance because designation and dominance use different legal tests.²¹⁷ A designated gatekeeper need not be dominant in the relevant Article 102 market, while a non-designated undertaking may nevertheless be dominant.²¹⁸

The dominant position must have a sufficient nexus with the disputed choice environment. The undertaking may be dominant in the gateway market itself, such as search, operating systems, app stores, or marketplaces.²¹⁹ It may instead use dominance in one market to shape access and competition in a related market.²²⁰ For example, dominance in an operating-system market may matter where the system controls the screen through which users select a browser. The nexus exists where dominance gives the undertaking control over a choice environment that is competitively important to affected rivals.

The second condition is control over the choice environment. Unlike dominance, which concerns market power, control concerns the factual ability to shape how users encounter, assess, or choose between offers. It may include setting defaults, determining visibility, designing switching steps, placing warnings, or controlling installation.²²¹ Control is not legal attribution. The disputed design must still result from conduct adopted, directed, or implemented by the undertaking. The common point is that it can shape the route through which users reach rival offers.

Control varies across digital markets. In Google Shopping, it concerned the presentation and ranking of search results, which shaped traffic to comparison-shopping services.²²² In Google Android, it arose through licensing and pre-installation conditions affecting how search and browser services were presented on Android devices.²²³ Both cases show that the conditions of user access can form part of the exclusionary mechanism.

²¹⁶ Consolidated version of the Treaty on the Functioning of the European Union art 102.

²¹⁷ Clav Šmejkal, 'Abuse of Dominance and the DMA – Differing Objectives or Prevailing Continuity?' (2023) 69 *Acta Universitatis Carolinae Iuridica* 33, 34.

²¹⁸ Tone Knapstad, 'Digital Dominance: Assessing Market Definition and Market Power for Online Platforms under Article 102 TFEU' (2024) 20 *European Competition Journal* 412, 413 <<https://doi.org/10.1080/17441056.2023.2280334>>.

²¹⁹ *ibid* 413, 420–421, 427.

²²⁰ *ibid* 421–423.

²²¹ Deutscher (n 13) 1352–54; Bostoen and Mândrescu (n 4) 447–49 both discussing how dominant digital platforms may structure user choice through ranking, visibility, defaults, pre-installation and access conditions.

²²² *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* (n 47) 57–60.

²²³ *Google LLC and Alphabet, Inc v European Commission* (n 37) 66–68.

The third condition is that the choice environment must be a material route to demand. This prevents Article 102 from becoming a general regulator of interface design.²²⁴ The question is whether the environment is important enough for its design to affect competition. The threshold is not met where the design has only a trivial aggregate effect or rivals can reach users through realistic and comparably effective alternatives.²²⁵

Materiality does not require indispensability in the Bronner sense.²²⁶ It is a threshold of competitive significance, not an essential-facilities test. The issue is whether the controlled environment is important enough for asymmetric design to reduce the demand rivals can realistically reach, not whether rivals have no other route to users. Google Shopping reflects this distinction because the concern was the importance of Google Search as a source of traffic, not total exclusion from users.²²⁷

Materiality depends on how far the interface mediates access to users. Relevant factors include the traffic or demand it channels, rivals' dependence on it, and the availability, cost, and effectiveness of alternatives. Switching costs, default effects, network effects, data advantages, and single-homing may increase that importance.²²⁸ These factors are not a checklist. They help show whether the interface meaningfully shapes how rivals are discovered, chosen, installed, or used.

This threshold uses the concept of addressable demand developed in Chapter 2. For this thesis, addressable demand is a foreclosure concept, not a method of market definition. It is the demand that a rival capable of competing effectively could realistically reach under a plausible alternative design that removes the disputed asymmetry while preserving legitimate product functions.

²²⁴ See Deutscher (n 13) 1346–48, 1360 (arguing that Google Shopping expands Article 102 into dominant firms' product and service design choices while failing to provide clear limiting principles); see also Pablo Ibáñez Colomo, 'Anticompetitive Effects in EU Competition Law' (2021) 17 *Jnl of Competition Law & Economics* 309, 334–36 <<https://doi.org/10.1093/joclec/nhaa031>> (arguing that competitive disadvantage or limitation of firms' freedom of action is insufficient, by itself, to establish anticompetitive effects).

²²⁵ On the competitive significance of multi-homing and switching as constraints on platform lock-in, see Europäische Kommission / Generaldirektion Wettbewerb and others, *Competition Policy for the Digital Era* (Luxembourg : Publications Office of the European Union 2019) 56–58.

²²⁶ *Oscar Bronner GmbH & Co KG v Mediaprint Zeitungs- und Zeitschriftenverlag GmbH & Co KG, Mediaprint Zeitungsvertriebsgesellschaft mbH & Co KG and Mediaprint Anzeigengesellschaft mbH & Co KG* [1998] ECJ Case C-7/97 [41–46] (holding that access is indispensable only where there is no actual or potential substitute and duplication of the facility is not economically viable).

²²⁷ *Google LLC and Alphabet Inc v European Commission* (n 2) paras 111–113 (the Court held that Bronner indispensability does not apply where access is already granted but made subject to unfair or discriminatory conditions, so the issue was not whether Google Search was an essential facility or whether rivals were wholly unable to reach users by other means.).

²²⁸ Deutscher (n 13) 1358–59 (discussing the importance of Google Search as a source of rival traffic and the limited effectiveness of alternative channels).

The three conditions perform a screening role. Dominance identifies the relevant market power. Control establishes the undertaking's ability to shape the choice environment, subject to separate attribution. Materiality shows that the environment is competitively significant rather than merely convenient. Only then does the analysis move to the substantive criteria.

4.3 The Three Substantive Criteria

Once the threshold conditions are met, the analysis asks whether the challenged design constitutes behavioural exclusion under the proposed framework. The three cumulative criteria identify the behavioural mechanism, determine whether it materially and asymmetrically reduces rivals' addressable demand, and assess whether that reduction is capable, in context, of producing exclusionary effects. Threshold materiality concerns the importance of the route to demand. The second and third criteria concern the effect of the challenged design.

4.3.1 Competition-Relevant Behavioural Mechanism

The first criterion asks whether the design works through a competition-relevant behavioural mechanism. A general change in user behaviour is not enough. The design must be capable of affecting whether or how users access, assess, or act on rival alternatives.²²⁹

Chapter 2 identified two pathways. Attention concerns which options users notice and consider. Effort concerns the burden of acting on an option once noticed. Conduct may use either or both. The test is objective and does not require proof that a particular user was misled or unable to switch.²³⁰ Nor does it require subjective intent.²³¹ The question is how the design predictably operates for users in the relevant context.

This criterion distinguishes behavioural exclusion from other mechanisms. Conduct operating through contractual linkage, technical restrictions, or financial inducements may fall more naturally within the categories discussed in Chapter 3. Conduct based on an identifiable comparative disadvantage may fall within self-preferencing. The categories may overlap. The purpose is to identify the main mechanism, not impose a rigid label.

The framework focuses on the default or typical route through which users encounter and act on competing options. Relevant features may include defaults, rankings, menu depth, warnings, prompts, installation or consent flows, and switching screens.

²²⁹ Oxera (n 81) 22–23, 30–31 (explains that behavioural economics identifies what drives search and switching costs and how product differentiation affects consumer behaviour at the “access, assess and act” stages, meaning users’ ability and willingness to search, compare products, and look for better deals).

²³⁰ *Google LLC and Alphabet, Inc v European Commission* (n 37) para 544 (rival downloads and default changes did not offset Google’s pre-installation advantage because they were not comparable in reach or effectiveness).

²³¹ *Hoffmann-La Roche & Co AG v Commission of the European Communities* (n 30) para 91.

The first criterion is only a filter. It identifies a competition-relevant mechanism but does not establish exclusionary effects. Defaults, salience asymmetries, or selective procedural friction may satisfy it when they predictably affect access to rival offers. The second criterion then asks whether the mechanism materially reduces the demand rivals can reach. Minor design differences, broadly symmetrical routes, and advantages attributable to the merits of the dominant undertaking's offer fall outside the framework.

4.3.2 Material and Asymmetric Reduction in Addressable Demand

The second criterion asks whether the design materially and asymmetrically reduces the demand that rivals capable of competing effectively can realistically reach. The focus is not user influence in itself, but whether the design limits rivals' practical access to demand for reasons not explained by the merits of the competing offers or genuine differences between the routes.

Because the mechanism is non-price, this criterion does not import the as-efficient-competitor test as a mechanical price-cost benchmark.²³² MEO concerned price discrimination and is not direct authority for behavioural exclusion.²³³ Its limited relevance is that differential treatment alone is insufficient and any competitive disadvantage must be assessed in context.

Applying that reasoning to non-price treatment in a digital choice environment is an analytical proposal rather than settled law. It has been developed in the literature on self-preferencing and discriminatory leveraging.²³⁴ For behavioural exclusion, the relevant difference is the unequal allocation of attention or effort between competing routes serving the same or a comparable user purpose. Its competitive significance depends on whether the resulting reduction limits rivals' ability to acquire users, achieve viable scale, or exert competitive pressure.²³⁵

The first element is addressable demand. A rival may offer a competitive product on price, quality, privacy, innovation, security, or user experience but still reach less demand because of the interface design.²³⁶ The question is whether rivals capable of competing effectively can realistically reach demand through the controlled choice environment.

Addressable demand is assessed by comparing the demand rivals can reach under the existing design with the demand they could reach under a plausible alternative that removes the

²³² *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* (n 47) 538.

²³³ *MEO – Serviços de Comunicações e Multimédia SA v Autoridade da Concorrência* [2018] ECJ Case C-525/16 24–25, 28–37.

²³⁴ Deutscher (n 13) 1355–58 (proposing the application of the MEO test to non-price self-preferencing by vertically integrated platforms).

²³⁵ *ibid* 159–60; Drawing on Steven C Salop and David T Scheffman, 'Raising Rivals' Costs' (1983) 73 *The American Economic Review* 267.

²³⁶ See Stones (n 7); O'Loughlin (n 7); Fischer, Hornkohl and Imgarten (n 13).

disputed asymmetry. The difference must be material in the market context and supported by specific evidence. If it is small, speculative, or absent, the criterion is not met. Users may simply prefer the dominant undertaking's offer on the merits.

The alternative design must be technically feasible, commercially realistic, compatible with legitimate product functions, and reasonably available at the relevant time. It is not an idealised neutral interface or a duty to adopt the design most favourable to rivals. It is an evidential benchmark for assessing whether the disputed asymmetry materially contributed to the reduction in addressable demand and whether the claimed function could plausibly have been preserved without it.

The second element is asymmetry. Friction is not abusive by itself. Different routes may reflect legitimate functions such as security, fraud prevention, privacy, informed consent, or protection against accidental switching.²³⁷ The question at this stage is whether attention, effort, or procedural burden is allocated unevenly in a way relevant to the alleged reduction in demand.

Asymmetry helps distinguish an advantage resulting from the merits of the dominant undertaking's offer from one created by the conditions through which users reach competing offers. The framework does not criticise a dominant undertaking merely for making its service easier to use. The criterion is met only where the evidence connects a material shortfall in rivals' addressable demand to the disputed design rather than to the relative merits of the offers or genuine differences between the routes. Addressable demand measures what rivals can realistically reach, while asymmetry links any shortfall to the design.

4.3.3 Capability to Produce Exclusionary Effects

The third criterion asks whether the reduction in addressable demand is capable, in its legal and economic context, of producing exclusionary effects. The second criterion identifies a material reduction in demand through the relevant route. The third asks whether that reduction is capable of weakening competitive constraints at market level. Article 102 does not require proof that foreclosure has fully materialised.²³⁸ Potential effects must still rest on concrete, context-specific evidence rather than speculation.

The assessment considers how the reduction interacts with the market. Relevant factors include the dominant undertaking's position, the importance of the interface, rival dependence, the effectiveness of alternative routes, default stickiness, switching costs, user inertia, network

²³⁷ Sunstein and Gosset (n 76) 75.

²³⁸ *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* (n 12) paras 50–53, 70–72; *European Superleague Company, SL v Fédération internationale de football association (FIFA) and Union of European Football Associations (UEFA)* (n 12) paras 126–131; *Intel Corp v European Commission* (n 12) para 138; *Post Danmark A/S v Konkurrencerådet* (n 12) paras 24–26.

effects, data advantages, duration, and the share of users affected.²³⁹ The point in the user journey may also matter.²⁴⁰ Designs affecting installation, initial default selection, renewal, or switching may have more persistent effects than interactions users can readily bypass or revisit.

Users most likely to switch may be especially important because their choices can discipline the dominant undertaking. Where the undertaking can personalise or repeatedly optimise the interface, it may reinforce friction around those users. A reduction in addressable demand may therefore weaken the constraint imposed by users most likely to switch.

Capability cannot be inferred from asymmetric design or reduced addressable demand alone. It may be absent where users can reach rivals through effective independent channels, switching is frequent, or the interface plays only a minor role in acquisition. Sticky defaults, network effects, and rivals' need for scale may support capability, but only on case-specific evidence. The inquiry asks whether the established reduction can weaken the competitive process.

4.4 Objective Necessity and Efficiencies

Where the three criteria are established, the undertaking may still show that the design is objectively necessary or produces countervailing efficiencies.²⁴¹ This safeguard prevents the framework from becoming a rule of interface neutrality or a ban on product improvement. It follows the ordinary Article 102 approach to objective necessity and efficiencies.²⁴²

Depending on the facts, legitimate objectives may include security, fraud prevention, privacy, prevention of accidental switching, technical integrity, accessibility, legal compliance, and genuine product improvement.²⁴³ Some friction may be necessary. A warning before disabling security protection, a confirmation before deleting data, or a permission request before transferring information may protect users or the service. Article 102 should not condemn such choices merely because they make switching less immediate.

The availability of a realistic design that would achieve the same objective with materially less exclusionary effect may show that the disputed asymmetry was not necessary or

²³⁹ On the contextual character of capability assessment under Article 102, see *Intel Corp v European Commission* (n 12) paras 138–40; *Post Danmark A/S v Konkurrencerådet* (n 12) paras 26–30; *Microsoft Corp v Commission of the European Communities* (n 2) 1060–62, 1088; *Confédération européenne des associations d’horlogers-réparateurs (CEAHR) v European Commission* (n 46) paras 95–105; *Tetra Pak International SA v Commission of the European Communities* (n 46) paras 36–37.

²⁴⁰ Jachimowicz and others (n 100).

²⁴¹ Communication from the Commission — Guidance on the Commission’s enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (Text with EEA relevance) 2009 paras 28–31.

²⁴² *ibid.*

²⁴³ Lundqvist Simon, *Justifications of Gatekeeper Conduct under the DMA and Article 102 TFEU : Examining the Scope of Effects-Based Reasoning and Objective Justification* (2025) s 4.3.1 <<https://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-565649>>.

proportionate.²⁴⁴ Where the undertaking invokes objective necessity or efficiencies, it must provide evidence supporting that claim, including why the proposed alternative was not realistic.

Alternatives must be assessed realistically. They should be technically feasible, commercially realistic, and compatible with legitimate product functionality.²⁴⁵ Article 102 does not require the design most favourable to rivals, equal prominence, or full neutrality. An unexplained burden on rival routes may nevertheless support a finding that the design departs from competition on the merits where it materially reduces addressable demand and a realistic alternative would preserve the claimed function.

The burden of proof follows the ordinary Article 102 structure. The authority or claimant must establish the ordinary legal requirements, the framework's threshold conditions and substantive criteria, and capability to produce exclusionary effects.²⁴⁶ If the undertaking raises an objective necessity or efficiency claim, it must support it with evidence.²⁴⁷ Relevant material may include technical specifications, security or privacy assessments, accessibility evidence, testing records, cost estimates, and evidence on alternative designs.

4.5 Evidence, Counterfactual, and Boundaries

The framework requires evidence. Defaults, salience effects, or user inertia do not establish behavioural exclusion by themselves. A counterfactual may help establish causation, but a parallel market or unaffected interface may not always provide a reliable empirical comparator.²⁴⁸ The absence of a perfect comparator does not reduce the evidential burden. The assessment may instead combine design analysis, market context, behavioural evidence, and available empirical indicators.

The counterfactual must reflect realistic design options available while the contested design was adopted or maintained. Later evidence may show what the undertaking knew, what effects occurred, or when an alternative became feasible, but it should not assume that an option existed before it was realistically available.

²⁴⁴ *Google LLC and Alphabet, Inc v European Commission* (n 37) para 883 (holding that Google's reputation and ecosystem-integrity objectives did not justify the restrictions because less restrictive measures, such as trademark-based protections, were available and would have been less restrictive of competition).

²⁴⁵ *Alphabet and Others v Autorità Garante della Concorrenza e del Mercato (Opinion of AG Medina)* [2024] Court of Justice Case C-233/23 [73–76].

²⁴⁶ *Servizio Elettrico Nazionale SpA and Others v Autorità Garante della Concorrenza e del Mercato and Others* (n 12) paras 50–53, 70–72.

²⁴⁷ *Post Danmark A/S v Konkurrenserådet* (n 12) para 42.

²⁴⁸ *Google LLC, formerly Google Inc and Alphabet, Inc v European Commission* (n 47) 377–382.

Evidence may concern three issues. The behavioural mechanism may be shown through interface structure, defaults, visibility, prompts, user testing, and click-through or drop-off data. Reduced addressable demand may be shown through path comparisons, switching, installation, abandonment, or conversion data. Capability may be assessed through market shares, network effects, rival dependence, alternative routes, acquisition costs, scale requirements, duration, and the design's coverage.

A/B tests, retention metrics, click-through data, and internal experimentation may also be relevant. Exclusionary intent is not required, but such material may show the expected mechanism, observed effects, available alternatives, and, where relevant, the undertaking's purpose.

Foreseeability is not an independent element of abuse. Internal experimentation and systematic measurement may nevertheless support the objective plausibility of the alleged effects and show whether they were observed or anticipated.²⁴⁹ Foreseeability cannot be inferred from control alone.

The framework also has clear boundaries. First, it does not impose interface neutrality. A dominant undertaking may improve and integrate its own service. The question is whether the resulting asymmetry departs from competition on the merits and is capable of producing exclusionary effects, subject to any objective necessity or efficiencies.

Second, the framework does not protect rivals that fail on the merits. If users prefer the dominant undertaking's offer because of price, quality, privacy, security, innovation, trust, or usability, Article 102 should not intervene. The framework applies only where the design, rather than the relative merits of the offers, materially restricts the demand rivals can reach.

Third, the framework is distinct from the DSA and consumer protection law. Article 25 DSA concerns interfaces that deceive, manipulate, or otherwise materially distort or impair free and informed decisions. This framework concerns the competitive process and rivals' access to demand. The regimes may overlap, but compliance under one does not determine the other.

Fourth, behavioural economics is not a general theory of digital unfairness. Critics argue that behavioural insights can be indeterminate and context-dependent.²⁵⁰ The framework responds through cumulative limits: dominance, control over a material choice environment, attribution where necessary, a competition-relevant behavioural mechanism, a material and asymmetric

²⁴⁹ Morozovaite, 'Hypermudging in the Changing European Regulatory Landscape for Digital Markets' (n 6) 82–82; Yeung (n 123).

²⁵⁰ For example, see Geoffrey A Manne, Lazar Radic and Dirk Auer, 'Regulate for What? A Closer Look at the Rationale and Goals of Digital Competition Regulations' (2025) 22 Berkeley Bus LJ 201 <<https://doi.org/10.15779/Z38M03Z022>>; Van den Bergh (n 146).

reduction in addressable demand not explained by the merits, capability to produce exclusionary effects, and objective necessity or efficiencies. Together, these limits define the evidence required and prevent behavioural influence alone from establishing liability.

4.6 The Framework as a Decision Tree

The framework is a staged inquiry. It begins with three threshold conditions. The undertaking must be dominant in a relevant market and control the choice environment through which users reach rivals. That environment must also be a material route to demand. If any condition is absent, this behavioural-exclusion framework does not apply. The conduct may still fall within another Article 102 category or another legal regime.

If the threshold is met, the analysis turns to three cumulative criteria. The design must use a competition-relevant behavioural mechanism, materially and asymmetrically reduce rivals' addressable demand for reasons not explained by the merits, and be capable of producing exclusionary effects. The undertaking may then rely on objective necessity or countervailing efficiencies. Conduct is abusive only where the ordinary Article 102 requirements, the framework's thresholds and substantive criteria are established, and no adequate justification is demonstrated. The decision tree on the following page shows this sequence.

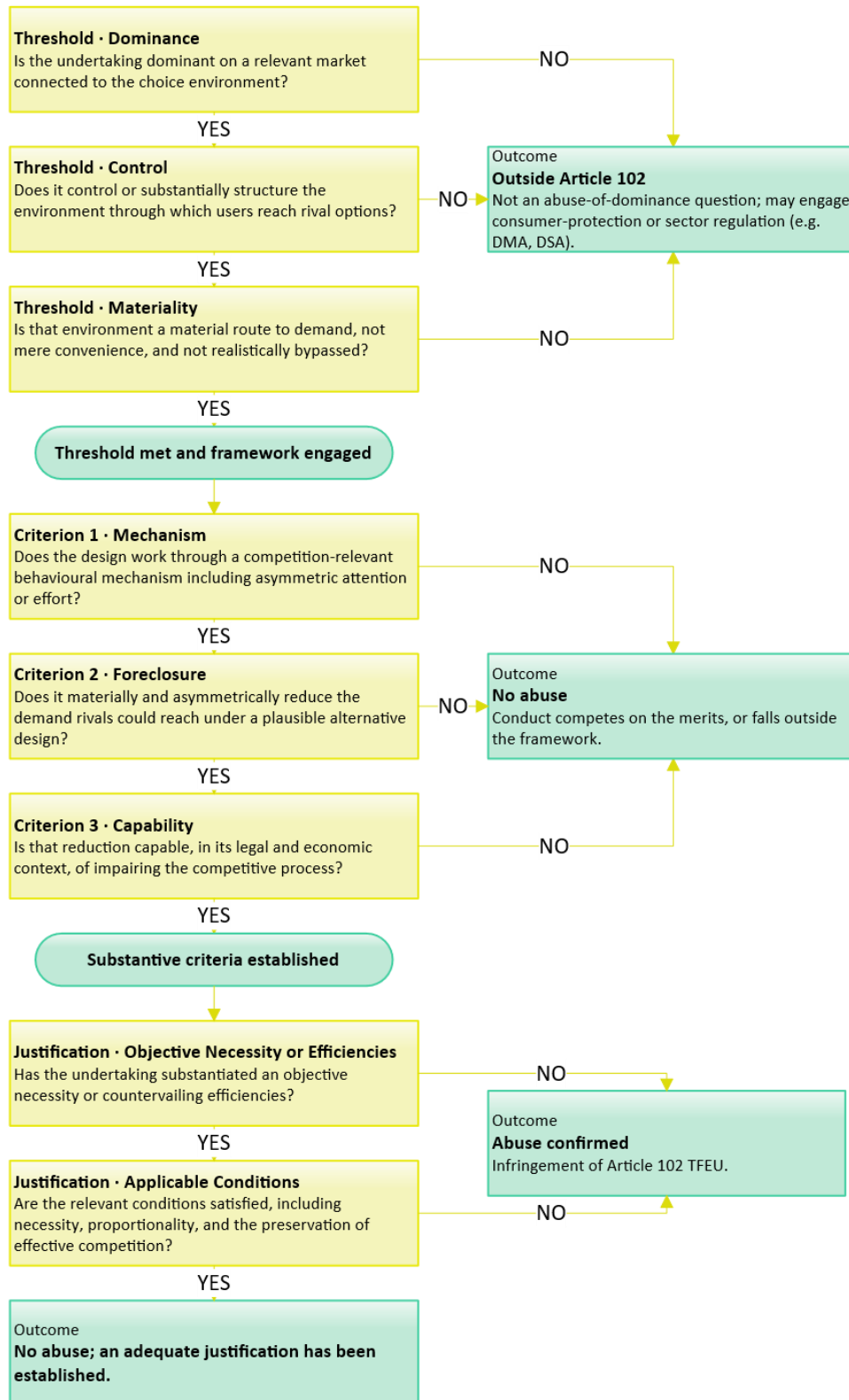


Figure 1- Assessing behavioural exclusion under Article 102 TFEU

Chapter 5: Conclusion

This thesis asked how Article 102 TFEU can address exclusionary choice architecture in digital markets. It concludes that Article 102 can address behavioural exclusion within defined limits. The framework applies where a dominant undertaking controls a digital choice environment material to rivals' access to demand and uses a competition-relevant behavioural mechanism to reduce that demand materially and asymmetrically in a way capable of producing exclusionary effects. It should not become a general standard for interface design.

The argument developed in three stages. Chapter 2 provided the economic and behavioural foundations. It explained that users do not always respond to better offers where a dominant undertaking controls how alternatives are encountered. The relevant tendencies were expressed through concrete mechanisms, including default inertia, salience, and effortful switching. They matter to competition law only when interface design materially reduces rivals' access to demand. Chapter 2 also explained why attentive users may provide a weaker constraint where the undertaking can shape switching costs, personalise friction, and learn from behavioural feedback. It then defined behavioural exclusion as a demand-side theory of foreclosure and introduced addressable demand.

Chapter 3 examined the fit of existing legal frameworks. The difficulty is analytical rather than one of substantive scope. Article 102 can address non-price and demand-side harms, but established categories rely on markers that may be absent in behavioural cases. Tying and bundling focus on product linkage, conditionality, integration, or inducement. Self-preferencing fits most clearly where there is an identifiable comparative disadvantage. These categories may capture some exclusionary choice architecture but provide only a partial fit where exclusion operates through an unequal allocation of attention or effort. The DMA and DSA do not remove that gap because they use different legal tests and pursue different aims.

Chapter 4 developed an operational framework within the general Article 102 analysis, informed by the special responsibility of dominant undertakings. That principle is not an independent prohibition and does not require dominant undertakings to assist rivals. The framework begins with dominance and two screening conditions: control over the choice environment and its materiality as a route to demand. It then applies three cumulative criteria: a competition-relevant behavioural mechanism, a material and asymmetric reduction in addressable demand, and capability to produce exclusionary effects. Objective necessity or efficiencies may justify conduct serving security, privacy, technical integrity, informed consent, or genuine product improvement.

The contribution is deliberately limited. The thesis does not claim that behavioural exclusion is a settled category of abuse or propose a new legal basis outside Article 102. It identifies a

demand-side mechanism that can be assessed through a structured framework without turning Article 102 into a general rule of digital fairness. Not every default, nudge, or friction is abusive, and design that makes a service attractive, simple, or convenient remains lawful. The concern arises only where design under the control of a dominant undertaking materially and asymmetrically restricts rivals' access to demand for reasons not explained by competition on the merits and is capable of weakening competition.

Two limits should be acknowledged. First, the framework is doctrinal and normative rather than empirical. Its application depends on case-specific evidence that the thesis identifies but does not collect. Second, dynamic and personalised interfaces complicate measurement because the gap between formal and effective choice may change in real time. These limits call for caution and specific, context-sensitive evidence, not the exclusion of the mechanism from Article 102.

Digital intermediaries increasingly shape the conditions in which users encounter competition. Article 102 is sufficiently open to assess the proposed mechanism in principle. The challenge is to apply criteria precise enough to identify exclusionary harm without restricting legitimate design. This thesis has proposed those criteria. Behavioural exclusion may arise where design under the control of a dominant undertaking materially reduces rivals' realistic access to demand by shaping how users encounter, select, retain, or switch between competing offers.

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