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Ex-ante versus Ex-post in Competition Law Enforcement: Blurred Boundaries and Economic Rationale*

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Abstract: This paper explores the evolving landscape of competition law enforcement, focusing on the dynamic interplay between ex-ante and ex-post approaches. Amidst the digital transformation and regulatory shifts, traditional enforcement mechanisms are being re-evaluated. This study aims to dissect the economic rationale behind these shifts, proposing a hybrid framework that balances legal certainty with the flexibility needed to address contemporary market challenges. In particular, the analysis highlights the emergence of new competition policy approaches that combine regulatory-type interventions with strengthened enforcement strategies.

Keywords: Competition Law Enforcement, Ex-ante and Ex-post Approaches, Anticompetitive Practices, Merger Control, Digital Economy.

JEL Classification: K21, L40, L86, D47.

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1. Introduction

The contemporary digital economy presents an array of regulatory challenges, particularly in safeguarding market access for small and medium enterprises (SMEs) and innovative start-ups while preserving a fair competitive landscape. Traditional EU competition law employs an ex-ante approach to merger control and an ex-post methodology to address anticompetitive practices. However, the 2022 Digital Markets Act (DMA)[1] marks a significant shift from this paradigm by imposing proactive dos and don'ts to preclude market tipping and maintain competition within digital ecosystems. This change underscores a growing perception of the need for preemptive action to prevent irreversible harm to market structures.

Economists traditionally view regulation with skepticism due to its inflexibility and potential for economic inefficiency. Conversely, the trend towards integrating ex-post assessments in merger control, as evidenced by the new interpretation of Article 22 of Regulation 139/2004 advocated by the EU Commission and the *Towercast* judgment,[2] indicates a movement towards a more nuanced approach that considers market complexities and technological disruptions. This article aims at providing a discussion on creating a more dynamic and flexible regulatory framework, one that can adapt to the uncertainties and political economic factors inherent in market regulation, ultimately aiming to streamline the decision-making process of competition authorities and reduce bureaucratic burdens.

Two critical dimensions are considered. Firstly, uncertainty merits a strategic approach to decision-making; at times, prudence dictates a delay in intervention, while at others, swift action is imperative to avert lasting harm to the competitive landscape. Secondly, the political economy of regulatory frameworks suggests that ex-ante regulations could, paradoxically, offer greater flexibility than ex-post enforcement, a notion supported by Rogeron and Shelanski (2019). The effectiveness of the 'effects-based approach' in reducing incorrect outcomes is acknowledged, yet it risks becoming ensnared in restrictive legal interpretations, protracted processes, and could undermine legal certainty, potentially leading to annulments due to overt errors in economic fact evaluation, as illustrated by the *Intel* litigation (Lauer, 2024).

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[1] Regulation (EU) 2022/1925 on contestable and fair markets in the digital sector (Digital Markets Act) and amending Directives (EU) 2019/1937 and (EU) 2020/1828. Official Journal of the European Union, L 265, 12 October 2022, pp. 1–66.

[2] Court of Justice of the European Union. Case C-449/21, Towercast SA v European Commission, Judgment of16 March 2023, ECLI:EU:C:2023:207.

We advocate for a more pragmatic and adaptable framework that addresses both the inherent uncertainties within the competitive authority's decision-making and the bureaucratic costs and risks. This approach builds upon prior advocacies for implementing adaptable remedies, especially in the context of merger interventions.

The structure of this article is outlined as follows. Section 2 delineates and scrutinizes our conceptual theoretical framework, emphasizing the fluid and often indistinct boundaries between ex-ante and ex-post approaches given varying levels of uncertainty and the bureaucratic costs associated with the enforcement of competition law. Sections 3 through 5 explore the balance between ex-ante and ex-post interventions, highlighting the diversity of implemented approaches and the historical evolution influencing the trade-off between the two, which continues to stimulate discourse within the realm of dynamic competition in digital industries. Specifically, these sections examine sanctions against cartels (Section 3), the prohibition of abuses of dominant positions (Section 4), and merger control (Section 5). Section 6 proposes a strategic roadmap by detailing each practice and its timing (ex-ante, ex-post), offering optimal strategic solutions, and engaging in a comprehensive discussion that sets the stage for future research inquiries.

2. Towards a Theoretical Framework

2.1 Competition and Competition Policy as a Dynamic Process

If one understands competition as a dynamic process among companies creating new strategies and adapt to strategies of competitors in a never-ending dynamic super-game of strategic interdependence, regulatory interventions into this process must deal with these dynamics and the effects of the intervention will depend on the reactions by the companies competing in the respective market. In other words, interventions into the process of competition represent a game of strategic interdependence themselves: the success of intervention depends on the reaction of the addressees of the intervention. Consequently, it is not enough to conceptualize competition as a dynamic process; competition policy also needs to be conceptualized as a dynamic process. In this view, the competition authorities are players within the dynamic market setting. In this role, they can intervene in two analytically distinct ways:

- Ex-ante intervention: competition authorities intervene before certain anticompetitive conduct and arrangements take place and seek to prevent their emergence.

- Ex-post intervention: competition authorities observe the dynamic process and intervene upon identification of anticompetitive conduct and arrangements, seeking to stop it.

While real-world policy instruments often are not pure in this regard – for instance, ex-post interventions also seek to deter future anticompetitive conduct by anticipation of ex-post sanctions – an analytical distinction between the two approaches is helpful to better understand the success and failure of authorities' intervention into dynamic processes of competition.

Let us assume that the goal of interventions is to minimize anticompetitive conduct and arrangements (broadly put: "protection of competition as a dynamic process"). Let us further assume that each policy will only imperfectly achieve this goal for a number of reasons: (i) imperfect knowledge of the authorities, (ii) self-interest of the authorities (which may or may not be in conflict to the goal), and (iii) creative competencies of companies, i.e., creating new strategies that cannot be known in advance as they are non-existing before creation.[3] The latter aspect includes unpredictable reactions to regulatory interventions that may undermine the goal of the intervention: companies can react conservatively-adaptive or creatively-innovative to regulatory interventions and "comply" to the new rules or to the intervention either by switching to a known-alternative from the strategy box (thus, contributing to achieving the regulatory goal) or by creating a new strategy "out of the box", which may maintain or even extend the anticompetitive character that caused the intervention just through new, innovative ways (Wegner, 1997). Thus, both the different dimensions of knowledge and uncertainty as well as the internal dynamics of the regulator – the bureaucratic costs catering the organizational self-interest and intra-administration incentives (Niskanen, 1968) – determine the pros and cons of ex-ante versus ex-post interventions.

2.2 The Dimensions of Uncertainty and their Effects on Ex-ante versus Ex-Post

Competition policy always relies on the identification of anticompetitive conduct and arrangements. It requires a theory of harm explaining why a certain conduct or arrangement by companies in the markets leads to anticompetitive effects and, thus, harms welfare. Ideally, this theory is supported by sound empirical evidence. More than 100 years of research in industrial, antitrust, and competition economics have created an impressive body of knowledge about the effects of company strategies on competition and the conditions for these strategies to exert

[3] This list serves the purpose of our paper and is not meant to be exhaustive.

negative effects or not. However, there are several ways of how uncertainty affects competition policy despite this knowledge:

- ambiguous and/or ambivalent effects of company strategies: depending on case-specific aspects, the (otherwise) same company strategy may display pro- or anticompetitive effects.
- unpredictable changes in the environment changing the nature of competition: disruptive new technologies, disruptive changes of society, or similar events may lead to structural breaks in the sense that the nature of competition does not continue from the past to the future but is subject to fundamental, principal change including completely new business models.
- creative powers of companies, developing new, formerly unknown strategies: the incentives of the dynamic process of competition push innovative behavior both to gain an advantage and to fend off the danger of falling behind the competitors. Since a relative advantage over competitors suffices for profitability, creative powers may be used to generate new procompetitive strategies (competition on the merits) or to generate new anticompetitive strategies (handicap competition).
- creative powers of companies, reacting to interventions with new, formerly unknown strategies: similarly, companies may react to regulatory intervention (including competition rules and antitrust case rulings) by switching to alternative conduct that is conformal with the intervention goals – or by creating new strategies that also (but in innovative ways) violate the intervention goals or produce other unwanted side-effects (Wegner, 1997).

Any rational competition policy strategy must consider the existence of these uncertainties and assess in which fields/areas they play a bigger or a smaller role.

In the hypothetical case of perfect knowledge, an ex-ante competition policy is superior to an ex-post competition policy. An ex-ante intervention prevents the damaging conduct or arrangements from happening – and thus the damage from occurring. If some of the damage from the anticompetitive conduct/arrangement is irreversible, the ex-post policy cannot completely resolve the damage whereas the ex-ante policy can (Budzinski & Mendelsohn, 2023, pp. 243-247). The same is true if damage compensation and claims are imperfect for whatever reasons. As a first result, we can conclude (ceteris paribus): the advantages of ex-ante intervention increase with the degree of knowledge about the competition effects of the conduct/arrangement in question.

Increasing uncertainties about the competition effects of specific company conduct/arrangements reduce the effectiveness of ex-ante interventions because the distinction of the case-specific circumstances that decide about the pro- or anticompetitive character of the conduct/arrangement may not be available ex-ante. This becomes even more evident when the effects are unknown ex-ante and only got revealed while the conduct/arrangement is happening. Ultimately, if companies innovate on new, hitherto unknown anticompetitive strategies, an ex-ante approach must fail because it cannot anticipate harmful strategies that do not exist ex-ante (Budzinski & Mendelsohn, 2023, pp. 243-247; very fundamentally: Hayek 1968, 1975). Parallel to the decreasing effectiveness of ex-ante policy, the relative effectiveness of ex-post interventions increases with increasing uncertainty. Indeed, the imperfections (irreversible damages, imperfect recovery of damage claims, etc.) remain but an ex-post intervention allows for a previous observation of the harmful conduct/arrangement. Thus, the option for developing a judgment based on case-specific empirical evidence and the benefits of analyzing actual market information and data emerges (Cabral et al., 2021). Altogether, we can conclude (ceteris paribus): the relative advantages of ex-post intervention increase with the degree of uncertainty about the competition effects of the conduct/arrangement in question as well as particularly about the company strategies themselves.

In summary, the advantages of ex-ante intervention can be better reaped when the dynamics of the competition process are not very high and predictability of company behavior and its effects is well developed. By contrast, the advantages of ex-post interventions can be better reaped when the dynamics of the competition process are high and unpredictable.

2.3 The Dynamics of Bureaucracy and its Effects on Ex-ante vs. Ex-Post

If competition authorities are no ideal enforcers but follow a utility function based on ideal goals (protecting the process of competition) and self-interested goals (reputation, budget maximization, etc.), inherent bureaucratic incentives lead to several imperfections:

- imperfect rules: despite available knowledge about the competitive harm of certain company conduct/arrangements, competition rules may follow self-interests or third-group vested interests conflicting with the protection of the competition process. Thus, deviations from an ideal competition policy may be politically motivated and occur already in the codification of the rules (including effects of lobbyism).
- imperfect agency practices: similarly, the agency-related practices of enforcement, such as case selection, investigation investment, decisions, etc., may be biased by the agency's self-interest (or, again, by lobbyism). For instance, high-profile cases may be

selected because they may boost the reputation of the agency as an enforcer whereas high-risk cases and such that are very unpopular may be ignored or neglected (if possible) to avoid the risk of reputation harm. The amount and depth of investment in investigating the case can be affected correspondingly. Eventually, decisions may be made also with a view on the probability of a (higher) court overruling the decision which may be (perceived as being) reputation-harming.

- imperfect courts: the nature of law courts is that they provide conservative incentives for the judges, e.g. regarding innovative and novel instruments, types of evidence, or theories of harm. Reputation effects and career mechanisms often favor judges whose judgments do not get overturned by a higher instance. Conservative proceedings and judgments ceteris paribus reduce the probability of this to happen.
- imperfections because of regulatory persistence and status quo biases. Outdated and obsolete regulations may persist because of barriers to political (change) action or because of the status quo being (wrongly) associated with having a value in itself (i.e., the normative power of the factual).
- risk of collusive equilibria between regulators and companies: if regulatory authorities and companies (as norm addressees) find a consensual solution of a case in question (in economic terms: a collusive equilibrium), then the risk of losing the case and the reputation risk can be mitigated. Such "deals" are only attractive, however, if both sides benefit. That implies that the protection of competition (a third-party effect regarding this deal) is likely to be reduced because otherwise the anticompetitively behaving companies have no incentive to join the deal. Consumers, society, and the process of competition are likely to be on the receiving end of such deals (Budzinski & Kuchinke, 2012).

Any rational competition policy must consider the existence of inherent deficiencies of authority regulation and assess how this impacts different fields/areas of competition policy intervention. Regulatory capture and conservative biases are relevant phenomena, which also affect the institutional design choice between ex-ante and ex-post interventions.

If enforcement processes were perfect, ex-ante intervention would be the matter of choice for the reason, again, that some damage from anticompetitive conduct/arrangements will be irreversible. Thus, low bureaucratic costs – including a low probability of deals and regulatory capture as well as a low probability of harmful status-quo biases – favor an ex-ante design of competition policy. Ideally, ex-ante regulation is self-enforcing, i.e. clear-cut prohibitions of

conduct/arrangements that are easily observable and unambiguously identifiable. However, if bureaucratic costs are high, ex-ante interventions start to suffer from the factors listed above, especially from regulatory capture and deals. Instead of self-enforcing rules, enforcement-wise more complex regulatory matters create scope and incentives for regulation that suits both the interests of the regulatory authority and the regulated companies (collusive regulatory equilibrium). For instance, if regulation and/or its effects are untransparent so that accountability becomes ambiguous, an intervention that ostensibly displays regulatory activity but in effect protects the rents of the regulated companies may work well for both sides. The regulation of the physical cable networks in energy and (formerly) telecommunications represent prime examples.

On the other hand, ex-post interventions are no perfect instruments to heal or avoid the pitfalls of high bureaucratic costs: ex-post interventions can suffer from all the downsides listed above as well – from overly conservative enforcement agencies and courts as well as from deals and regulatory capture. For instance, ex-post detected violations of competition law could be resolved by deals or settlements reducing sanctions for the companies in exchange of an agreement to relinquish law procedures seeking to counter or modify the sanctions. Thus, anticompetitive companies achieve a reduction in sanctions (maybe even accompanied by a reputation-saving non-disclosure of the details of evidence), whereas competition authorities achieve a quick success and avoid a reputation-damaging loss in the courts. Furthermore, competition authorities may simply refuse to take up cases. Interestingly, we recently saw a number of highest court judgments ruling (ex-post) that sports associations have abused their market power.[4] Notably, none of these cases was brought or even in-depth investigated by competition authorities. Instead, private parties being on the receiving side of the anticompetitive practices in question fought these cases through. This demonstrates that ex-post interventions – through private enforcement – offer an additional, admittedly highly imperfect channel for enforcement in high bureaucratic cost areas of competition policy. Furthermore, an ex-post regime is generally less disturbing of creative market forces (Franck & Peitz, 2021),

[4] Cases Super League (European Superleague Company, Court of Justice judgment, 21 December 2023, case C-333/21), ISU (International Skating Union, Court of Justice judgment , 21 December 2023, case C-124/21 P), Antwerp (Royal Antwerp Football Club, Court of Justice judgment, 21 December 2023, Case C-680/21), see also Case C-650/22: Request for a preliminary ruling from the Cour d'appel de Mons (Belgium) lodged on 17 October 2022 — Federation Internationale de Football Association (FIFA) v BZ.

which in turn imperfectly discipline self-interested agency intervention by finding creative workarounds.

In summary, high bureaucratic costs represent problems for both ex-ante and ex-post interventions. However, (imperfect) countermeasures are better available in the case of ex-post interventions.

2.4 Towards an Analytical Scheme

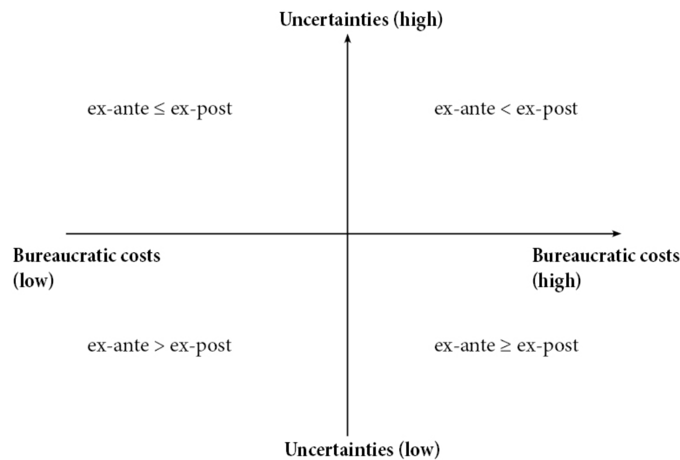
Considering the reasoning in the two preceding sections, uncertainty management and bureaucratic costs can be stylized by classifying them in four areas (see Figure 1):

- low uncertainty and low bureaucratic costs: ex-ante > ex-post. This area is associated with comparatively “easy” and – in its extreme boundary – perfect enforcement that can put focus on preventing permanent and irreversible damage from happening. Here, the imperfections discussed in the preceding sections do not play a relevant role and ex-ante interventions outperform ex-post policies.
- high uncertainty and high bureaucratic costs: ex-post > ex-ante. In this area, the presence of dynamic and complex competition processes imply that interventions are inherently imperfect and error-prone. Any ex-ante regulation is unlikely to achieve its goals due to the unpredictability of the creative forces of the competitors inventing both on hitherto unknown anticompetitive strategies and on circumvention strategies, thus eroding the intervention goals. Imperfections in the enforcement process and a high probability of regulatory failure increase the attractiveness of deals establishing collusive equilibria between regulators and regulated companies – both of whom benefit at the expense of third-parties, customers, and society. Ex-post interventions are not perfect either but can serve to stop the most damaging and most dangerous anticompetitive conduct and arrangements from continuing because they benefit from the availability of empirical observation and evidence of the anticompetitive conduct/arrangements.
- low uncertainty and high bureaucratic costs: ex-ante ≥ ex-post. Good but not perfect knowledge about effects meets high bureaucratic costs and a high risk of regulatory capture. In this mixed zone, ex-ante elements may serve as the foundation of interventions, but they benefit from being complemented by ex-post elements that allow to reconsider wrong developments and adjust interventions.
- high uncertainty and low bureaucratic costs: ex-post ≥ ex-ante. Dynamic competition and/or ambivalent as well as ambiguous effects of companies’ conduct and arrangements meet (comparatively) capable intervention options. Due to the uncertainty

and the inherent dynamics, ex-post intervention should be the fundament, but complemented by ex-ante elements to handle the clear-cut cases.

Note that the classification into four areas serves as a stylized framework and simplifies the complex reality of competition policy. These areas are not internally uniform; as a specific area approaches one of the boundaries, the characteristics and implications of that area increasingly blend with and are complemented by those of adjacent areas.

Figure 1. Classification of Regulatory Strategies by Uncertainty and Bureaucratic Costs



Of course, our analytical framework is a model in the sense that it ignores certain aspects that are also relevant to the design of competition policy. The literature often advocates for ex-ante instruments as quicker and facing fewer enforcement hurdles (inter alia, Colomo, 2021; Monti, 2021; Furman et. al., 2019; Podszun et al., 2021). This is not merely an extension of the irreversible damage argument (see section 2.2) but highlights that delays in procedures can often be mitigated through thoughtful design rather than solely choosing between ex-ante and ex-post approaches. Similarly, the need for clear, unambiguous rules that reduce legal uncertainty (Colomo, 2021; Monti 2021; Vezzoso, 2021), concerns about the under- or over-inclusiveness of norm addressees (Geradin, 2021), and inconsistencies across different regulations (Graef, 2021; Vezzoso, 2021) and national competition policies (Budzinski et al., 2020) are critical considerations that also demand careful attention.

Moving from the theoretical exploration of competition dynamics under the pressures of both ex-ante and ex-post regulatory frameworks, Sections 3, 4, and 5 examine the application and implications of these frameworks across different domains of competition law. These sections aim to explore how traditional and contemporary enforcement strategies manifest in contexts of cartels, abuses of dominant positions, and merger control.

3. Cartels

3.1 The Balance Between Ex-Ante and Ex-Post Interventions

The balance between ex-ante and ex-post interventions in the field of anticompetitive agreements combines a general ex-ante prohibition of cartels with ex-post interventions into detected violations and regarding exemptions if one considers both EU and US practices. Since so-called hardcore cartels (like price-fixing, quantity- or quota-fixing, or market division) – intercompany agreements that eliminate competition in most of the relevant market and replace it by monopoly-style behaviour – virtually always reduce social welfare, their general ex-ante prohibition corresponds to the comprehensive knowledge about their harm. The economic effects of other cartels (including partial cartels of marketing, research and development, etc.) is more ambiguous, which is why the case of ex-ante or ex-post is more complicated for exemptions. A block exemption system exists in Europe, which reduces the administrative burden for the Commission and increases legal certainty for companies, but it is not the only way in which an inter-company agreement can be accepted within the EU.

An ex-post assessment of cartels can lead to the absence of a penalty if the net effect is positive, in other words, if the gains resulting from the coordination (in terms of productive efficiency, innovation, environmental protection, etc.) outweigh the competitive damage. Thus, the ex-post dimensions take precedence, and, in this respect, the European model converges with the US practice, where the tort law model prevailed as early as the Sherman Act in 1890 and where the assessment of the effects of an agreement is also based on a rule of reason assessed by the judge (Posner, 1977).

3.2 Historical Perspectives and Evolution

Historically, anti-cartel enforcement in the US, as based on the Sherman Act, operates on an ex-post (adjudicatory) model. This includes specific antitrust immunity mechanisms for sectors such as sports and airlines. Traditionally, enforcement involves a judicial decision grounded in common law principles, where cartels are deemed the “supreme evil of antitrust.”[5]

[5] Verizon Communications v. Law Offices of Curtis V. Trinko, 540 U.S. 398, 408 (2004).

This balance is not, however, a historical constant. Indeed, the European Union (EU), at least partially influenced by ordoliberalism[6] and the administrative framework on which it was founded, the approach to cartels historically diverged significantly from the US model. Initially, EU competition law enforcement adopted an ex-ante perspective to exemptions, implementing a notification system through Regulation 17/62. The choice of an ex-ante model made economic sense as it provided clear deterrent signals and legal certainty for firms. However, the downside of a clear signal is that it opens opportunities for circumvention and the initial European model eventually failed because of the administrative costs associated with its implementation. It was also progressively phased out as administrative burdens mounted and firms began to overload the system with strategic notifications, stretching the limited resources of the European Commission (EC). Despite these theoretical merits, the notification system's clarity was overshadowed as the EC's capacity to control and enforce was overwhelmed.[7]

3.3 Functions and Benefits of Ex-Post Assessments

Ex-post assessments in regulatory practices serve multiple significant functions that enhance the effectiveness and fairness of antitrust enforcement.

Firstly, by granting provisional immunity and observing the resultant effects, such assessments can prevent regulatory overreach, ensuring that authorities do not overcharge entities. This allows for a more balanced and just application of regulatory powers.

Secondly, ex-post assessments enable entities that cooperate to present efficiency-based defences in a less speculative way compared to an ex-ante control.[8] These defences can encompass various beneficial aspects such as innovation, research and development, and environmental impacts, providing a comprehensive view of the potential benefits of their

[6] Akman and Kassim (2010) discuss how ordo-liberalism significantly influenced the development of EU competition policy. They explain that ordoliberal principles, emphasizing the importance of a strong legal framework and state intervention to ensure market competition, were institutionalized in the EU's approach. This has shaped the EU's stringent regulatory policies and enforcement mechanisms designed to prevent monopolies and promote market fairness.

[7] According to Warlouzet (2016): "*The implementation of Regulation 17/62 quickly became a nightmare for the Commission. In April 1963, the Commission received 36,000 notifications, while DG IV had only 78 officials in 1964*".

[8] The issue at stake echoes the problems of the evaluation of efficiency gains in merger control. Competition authorities tend to disregard them as they appear as speculative and to a significant extent dependent from firms' future behaviour. Therefore, an ex-post assessment reduces this moral hazard related risks for the competition authority.

cooperative actions. Moreover, ex-post mechanisms improve the monitoring of cooperation between entities. This is particularly evident when compared to cases like the AdBlue situation, where previous monitoring efforts may have faltered. By providing a more robust oversight mechanism, ex-post assessments help ensure that cooperative behaviors are maintained within legal and ethical boundaries. Furthermore, these mechanisms are not as costly as often presumed and are less likely to lead to false positives. This cost-effectiveness and accuracy stem largely from the use of negotiated procedures, such as leniency programs and the non-contestation of grievances, which streamline the investigative process and reduce unnecessary expenditures.

Lastly, the ex-post approach has a strong deterrent effect, as it is well-suited to facilitating follow-on actions. This capability significantly enhances the overall deterrent impact of antitrust enforcement, discouraging potential violators by highlighting the serious consequences of non-compliance. For instance, the UK's Office of Fair Trading has documented the widespread deterrent impact of its competition law enforcement, highlighting how rigorous enforcement can prevent anti-competitive behavior across various sectors.[9]

3.4 Continuing Challenges and the Need for Ex-Ante Measures

While cartel sanctions have largely transitioned to this ex-post model, a notification system remains for block exemptions[10] and remains under discussion regarding enforcement under Article 101(3) of the Treaty on the Functioning of the European Union (TFEU). In such domains the need for legal certainty and the benefits associated to the prevention of future risks and costs associated with potential procedures remain. Indeed, companies face legal uncertainty as their individual cooperation can be qualified ex-post an anticompetitive one. The necessity to provide more certainty to the economic players is currently leading the European Commission to issue guidelines to comfort firms' expectations regarding the compliance of their cooperation with antitrust rules as the case of durability agreements testify. This trend reflects the challenges of dynamic competition as the radical uncertainties associated to

[9] See OFT (2007) and Delgado et al. (2016).

[10] These exemptions only apply to non-hardcore restriction practices, excluding price-fixing agreements and market-sharing arrangements. Additionally, the ex-ante approach does not cover all inter-company agreements to limit administrative burdens, as seen in the de minimis rules. According to the Commission's guidelines for the application of Article 101(3), agreements must: (1) improve production/distribution or promote progress; (2) allow consumers a fair share of benefits; (3) impose only necessary restrictions; and (4) not eliminate competition (Commission, 2004a, para 32–116). See Bartalevich (2016).

ecological transition raises the question whether and when firms' cooperation and even investment coordination may be necessary[11] - or whether and when they may cause more harm than good. The same logic may apply for digital markets as innovation and products and services complementarities may or may not imply firms' cooperation and information exchanges.

Indeed, ex-post regulatory approaches, while beneficial in several respects, also present significant challenges, and limitations. Firstly, ex-ante regulation is crucial in securing cooperative efforts among firms, especially in critical areas such as research and development (R&D) and environmental dimensions (Gaffard and Quéré, 2006). These areas often require a stable regulatory environment to foster collaboration and shared innovation.[12] However, the overall net effects of these practices are difficult to ascertain, largely due to the complexities involved in defining appropriate counterfactuals and accurately evaluating pass-on effects. This difficulty underscores the potential advantages of ex-ante approaches, particularly for innovative strategies that require rapid adaptation to new technologies and market conditions.

These exceptions to the ex-post enforcement model are likely to remain limited to specific contexts, beyond the fundamental ex-ante prohibition of hardcore cartels (see 3.1). The rise of algorithmic strategies in market practices, particularly algorithmic collusion,[13] highlights the need to re-evaluate the balance between ex-post and ex-ante approaches. Algorithms may inadvertently increase the likelihood of tacit collusion without explicit communication,[14] complicating detection, enforcement, and the burden of proof in legal contexts. Such dynamics

[11] See Inderst & Thomas (2016), for an example regarding the use of sustainability labels which can require an exchange of competitively sensitive information about production standards throughout the entire supply chain, including horizontal supplies between downstream competitors.

[12] In particular, Spulber (2023) highlights the importance of innovation competition among firm. He states that "*Markets with more innovation competition may exhibit greater cooperation among firms than markets with less innovation competition. Antitrust should recognize that much of this cooperation is pro-competitive and not the result of collusion.*" (pp. 35).

[13] For a comprehensive synthesis on algorithmic collusion, see Assad et al. (2021). The authors provide an extensive overview and opens discussions on policy recommendations, addressing how autonomous algorithms can facilitate collusion among firms and the potential regulatory responses to mitigate such risks.

[14] While characterizing a tacit collusion equilibrium may be challenging and unlikely to achieve under realistic assumptions, the increase in prices above competitive levels may nevertheless result from the implementation of more advanced algorithms (see for contrasting views Schwalbe 2018 and Buchali et al. 2023 versus Abada et al., 2024).

may call for a proactive approach to regulation, including compliance checks, certification processes, due diligence, and specific liabilities related to algorithm-driven actions. In oligopolistic markets, where tacit collusion often resembles parallel behaviour but has distinct implications for competition policy, ex-ante regulatory involvement can help mitigate risks. Innovative strategies such as safe-harbour provisions, immunity grants, and sandbox-type frameworks can facilitate controlled experimentation, enabling real-time observation of the effects of inter-firm cooperation. These measures not only enhance regulatory responsiveness in rapidly evolving markets but also ensure compliance by design, complementing traditional ex-post proceedings to address the challenges posed by algorithmic and complex anticompetitive behaviour effectively. This issue has been highlighted in the seminal debate between Posner and Turner regarding oligopoly problems (Mendelsohn, 2020; Lianos & Wagner von Papp, 2022), also emphasizing that striking the right balance is far from being trivial.

4. Abuse of Dominant Position

4.1 The Ex-Post Examination Framework

In both Europe and the US, the framework for addressing abuses of dominant positions is established within tort law, requiring an ex-post examination of practices based on rules or the effects observed. This retrospective approach is essential for several interrelated reasons.

Firstly, the ex-post method enables competition authorities to specifically target the abuse of a dominant position, rather than the dominance itself. This ensures that firms are held accountable not for achieving market dominance (which may be related to disruptive innovation), but for leveraging this position in ways that harm competition and consumer welfare. However, this is exactly an area where one and the same company strategy may display contrary effects depending on whether it is conducted by a company in intense competition or by a company with market power. Thus, the effects of certain strategies and conduct crucially and sensitively depend on the case details. Furthermore, markets often embody complexities, asymmetries, and incomplete information. By adopting an ex-post approach, authorities can make more accurate assessments based on comprehensive data analysis conducted after the alleged abuses have taken place, thus addressing the challenge of imperfect information. It would be impossible to derive a definite blacklist of anticompetitive conduct abusing market power because companies create new forms of anticompetitive and abusive conduct in the

course of time. Especially, competition processes with high dynamics lead to a fundamental ex-ante unpredictability of harmful conduct and arrangements. The scope for new, innovative but anticompetitive and abusive behavior is much larger compared to cartelization since it encompasses all varieties and dimensions of dynamic competition.

Beyond that, the ex-post effects-based approach can enhance legal certainty, allowing appealing courts to control manifest errors of appreciation in the economic field.[15] Additionally, sanctions applied after thorough investigations provide a foundation of concrete evidence, allowing both the agencies and the firms involved to understand the merits of each case clearly. Such clarity is crucial for maintaining fair competition and ensuring that punitive measures are justly imposed.

Lastly, by evaluating actions and their impacts after they have occurred, the ex-post approach also serves as a safeguard against regulatory capture. It upholds transparency and curtails the potential for arbitrariness in regulatory decisions, thereby protecting the integrity of market operations and promoting a fair competitive landscape. In other words, it participates to the guarantee of the rule of law and to the one of a due process.

4.2 Remedial Measures and Their Effectiveness

In the realm of competition law, remedial measures align well with an ex-post logic, serving both as a deterrent and as a signal. These measures, such as sanctions or injunctions, are designed to cease anticompetitive practices or to restore the competitive conditions that would have existed had the anticompetitive actions not been implemented. This restoration is crucial for maintaining dynamic competition and consumer welfare.

Competitive remedies in abuse of dominant position cases may blur the line between ex-ante and ex-post dimensions as well as between competition enforcement and regulation. For instance, behavioral remedies may impose long-term constraints that require perpetual and resource-intensive oversight, straddling the divide between proactive and reactive regulatory logics. Furthermore, there are instances where ex-post remedies appear ineffective in deterring anticompetitive practices or in mitigating their effects. Financial penalties imposed on monopolies can lead to cost pass-through to consumers, diluting the intended punitive effect.[16]

[15] See, e.g., the use of the As Efficient Competitor (AEC) test in the Intel case (Lauer, 2024).

[16] On this aspect, see, e.g., Marsden (2020), on *Google Shopping*.

Similarly, no remedy can resurrect a competitor that has been irreparably damaged by anticompetitive behavior.

In addition, the more complex the cases, the more difficult the definition of a deterrence strategy, and the higher the risk of false positive decision. The costs and the duration of antitrust litigations may also lead to several undesired effects. It can deter smaller market players to sue dominant firms. It may lead to excessively long procedures leading to sanction misbehavior while the exit is effective and difficult to remedy as soon as barriers to entry are significant. In addition, remedying to a competitive damage leads to impose behavorial remedies difficult to craft in a context of imperfect information (incomplete and asymmetric) and especially difficult to supervise (considering moral hazard related issues).

4.3 The European Digital Markets Act and Ex-Ante Approaches

In response to these challenges, the European DMA can be viewed as a legislative shift towards addressing these limitations. It offers a streamlined, less complex, and cost-effective procedure with a preventive focus, symbolizing a (re)discovery of the merits of ex-ante approaches. The DMA represents a significant evolution in regulatory strategy, aiming to pre-emptively curb the market power of digital giants before the materialization of harmful effects, thereby reinforcing the overall effectiveness and efficiency of competition policy. In this area, ex-ante measures make it possible to constrain firms' behavior *ab initio* to prevent anticompetitive strategies that could produce irreversible effects that corrective measures could no longer correct ex-post (this is the case, for example, with tipping). Ex-ante intervention therefore makes it possible to prevent situations of structural competition failures that – if at all – it would only be possible to remedy through structural remedies that are particularly difficult to implement in the context of Article 102 proceedings and particularly costly in economic terms, whether in terms of efficiency losses or transaction costs.[17] Such a link between antitrust and regulation was, in fact, part of the rationale behind the enactment of the FTC Act in the US in 1914: practices had to be addressed at their inception, before they could affect the market. This approach offers a twofold advantage: it limits the risks to competition and the associated costs, and it enhances legal certainty for companies, which can be assured that the practices they engage in will be penalized without needing to self-assess their potential ex-post effects.

[17] See Chopra & Khan (2020) for a parallel with the US antitrust concerning the Section 5 of the FTC Act.

4.4 The Merits and Challenges of Ex-Ante Regulation

In the complex landscape of market regulation, the merits of an ex-ante approach are significant, especially in dynamic sectors like digital ecosystems. Firstly, ex-ante measures such as prohibitions and obligations are essential for preventing irreversible damage. They safeguard against competition tipping by proactively curbing harmful behaviors before they manifest widespread adverse effects, as highlighted by Cabral et al. (2021). This proactive stance is crucial in digital markets where rapid changes can solidify dominant positions before effective countermeasures can be implemented.

Furthermore, ex-ante regulation is adept at addressing complex anticompetitive behaviors that are often challenging for antitrust litigation due to stringent evidence standards. This includes sophisticated strategies such as algorithmic manipulation and self-preferencing, which traditional ex-post assessments may struggle to pinpoint and remedy effectively. Additionally, by streamlining market oversight, ex-ante approaches facilitate quicker interventions, thereby minimizing enforcement challenges and ensuring more timely corrective actions (Colomo, 2021).

The control of market contestability and stability is another significant benefit. Ex-ante measures ensure that markets remain competitive and sustainable, especially in sectors prone to significant structural failures, as indicated by the introduction of the June 2020 'New Competition Tool.' This tool reflects an understanding that preemptive measures can prevent market structures from evolving in ways that later necessitate costly and disruptive interventions.

Legal certainty and protection are further enhanced through an ex-ante intervention. By defining clear rules and expectations upfront, this approach reduces procedural costs and provides better protection for the weaker parties in private enforcement scenarios. Moreover, adaptability is a critical feature of an effective ex-ante regulation model. It must be sufficiently flexible to accommodate new market trends and the evolving strategies of firms.

However, implementing an ex-ante model is not without dilemmas. It requires a delicate balance between preventing irreversible damages in rapidly evolving markets and avoiding overly restrictive measures that could stifle dynamic market activities. Four key dimensions must be considered to achieve this balance: the knowledgeability of potential damages, the capacity to identify and characterize harmful practices accurately, the administrative costs involved, and the conditions necessary for maintaining effective flexibility (see section 2).

4.5 Limitations and Dilemmas of Ex-Ante Approaches

If such transition toward an ex-ante approach makes sense in a context a dynamic competition, it remains that it is also characterized by some pitfalls of limitations. Ex-ante regulation is designed with a preventive intent, aiming to mitigate potential market risks before they manifest. This approach, however, brings with it a series of challenges and potential drawbacks that are crucial to understand in the context of regulatory effectiveness and market dynamics.

At the heart of the regulatory framework is a classic Law and Economics dilemma – balancing regulation with liability (Posner, 2010). Liability requires that costs be externalized onto involved parties, demanding decisions based on comprehensive information and providing a degree of flexibility often lacking in ex-ante regulation. This inherent rigidity can hinder the approval of practices that might otherwise demonstrate a net positive effect and may also prompt strategies designed to circumvent regulatory measures.

One significant challenge of preemptive regulation is the difficulty in accurately predicting future harms, a concern famously articulated by Hayek in 1945. The inability to foresee which actions will turn out to be detrimental can lead to regulatory overreach or oversight gaps, neither of which is conducive to a healthy competitive environment. Particularly in dynamic sectors like the digital economy, the probability of competitors innovating on anticompetitive and abusive strategies is immense. The obligations of the DMA, for instance, mostly address anticompetitive conduct that was part of past antitrust proceedings. It seems highly unlikely that those companies that are dominating digital ecosystems will rely on these same "old" strategies to reap their market power rents in the future (Budzinski & Mendelsohn, 2023). Instead, it is likely that the ongoing dynamics in the digital economy will incentivize and necessitate the creation of new strategies, some of them being anticompetitive and abusive – and all of them being unanticipated by the DMA and other ex-ante regulation.

Moreover, ex-ante regulation can stifle creativity and innovation. Franck and Peitz (2021) argue that ex-post assessments, by contrast, tend to interfere less with innovation because they allow more room for experimentation without the immediate threat of regulatory repercussions. The inflexibility of regulatory frameworks, such as the DMA, can severely restrict the ability of markets to adapt to new trends and innovations. This rigidity can freeze the development of

potentially beneficial innovations at their inception, preventing them from contributing positively to the market.[18]

Furthermore, the economic and administrative costs associated with implementing ex-ante regulations are considerable. These include not only the financial burden on regulators and the regulated entities but also the diversion of resources from potentially more productive activities. The heavy bureaucratic demands can lead to inefficiencies and may even result in regulatory capture, where regulators become overly influenced by the very industries they are meant to oversee.

Another critical issue is the unintended consequences of regulation. Companies may develop anti-competitive strategies or find new ways to assert market dominance as a response to regulatory constraints, thereby undermining the very goals of regulation (Wegner, 1997). Caffarra and Scott Morton (2021) highlight how regulated entities might adapt in ways that foster the anti-competitive behaviors regulations aim to prevent. Additionally, while ex-ante rules aim to preempt harmful practices, their rigid nature often fails to adapt to the evolving strategies of market actors, necessitating a reactive, ex-post approach to counter circumvention effectively. The more dynamic the market, the higher the risk of rapid rules obsoleteness.[19] This particularly refers to the inherent dynamics of the digital economy.

4.6. Toward a More Pragmatical Ex-Post Enforcement Approach

If such fast-moving competitive environments advocate for modernized and reformed anticompetitive unilateral practices ex-post policies, instead of implementing or at least accompanying ex-ante regulation (such as the DMA), then upgrading and re-arming abuse control may be the way to go to our theoretical framework (see Section 2). An illustrative example is the 'German approach,' which enhances abuse control to encompass cross-market power—a phenomenon frequently observed in platform markets and digital ecosystems.[20]

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[18] For further reading on participative, pro-innovation antitrust approaches, see Bethell et al. (2020).

[19] For an interesting contribution on this topic, see Kerber (2023). Kerber argues that competition authorities face a dilemma between conducting deep case-specific analyses and adopting a rules-based approach, especially regarding innovation effects. He suggests that due to the uncertainty in innovation processes, it may be necessary to develop suitable presumptions for certain cases rather than relying solely on case-specific assessments.

[20] Germany introduced a new paragraph into its competition law (Art. 19a German Law against Restrictions of Competition), which prohibits the abuse if cross-market power and empowers the competition authority to intervene against companies that enjoy and abuse such positions (Budzinski, Gaenssle & Stöhr 2020). Stöhr and Mendelsohn (2024) provide an early empirical comparison of Art. 19a cases with DMA cases.

Indeed, this 'more pragmatic' approach aligns with the European Commission's 2024 initiative, as reflected in the new Notice on the definition of relevant markets,[21] which replaces the 1997 version, and in its draft Guidelines on the enforcement of Article 102 concerning exclusionary abuses.[22] These draft Guidelines represent a potentially significant step toward a more flexible enforcement framework by, first, narrowing the scope of overly defendant-friendly tests, such as the AEC test, and second, proposing a three-tiered enforcement system grounded in varying types of presumptions. Although it seeks to improve the arsenal of ex-post interventions against abuse of dominance, it shies away from introducing cross-market or systemic market power as a category whose abuse requires combating (Budzinski & Stöhr, 2024).

The draft Guidelines outline three distinct enforcement regimes. The first applies to market practices where the burden of proof lies with the Commission to demonstrate that such practices are capable of producing anticompetitive exclusionary effects. This aligns with the principles of the *effects-based* approach introduced in the February 2009 Communication on Article 82 enforcement priorities. The second regime pertains to 'naked restrictions,' where a *per se* prohibition may be warranted, as these practices generally lack any economic justification beyond impeding competition. The third and most relevant regime for our analysis involves a reversal of the burden of proof for certain complex market practices, such as exclusivity agreements, rebates, exclusionary pricing schemes (e.g., predatory pricing or margin squeeze), and certain tying arrangements. Under this regime, a rebuttable presumption of exclusionary effects can be established.

The three regimes outlined in the draft Guidelines reflect the state of available economic knowledge and the likelihood of emerging forms of anticompetitive conduct (see Section 2). For naked restrictions, the economic knowledge about the effects is relatively robust and does not require careful case-by-case analysis. Therefore, while firmly staying in the ex-post area of competition policy (see section 4.1), the draft Guidelines suggest an element of ex-ante here: these naked restrictions constitute abuses without further ado, thus implementing regulation-style prohibitions that can be expected to work particularly through their ex-ante deterrence effect on company behavior. The rebuttable presumptions regime addresses potential abuses

[21] Communication from the Commission – Commission Notice on the definition of the relevant market for the purposes of Union competition law [2024] OJ C1645/24, available at http://data.europa.eu/eli/C/2024/1645/oj

[22] "Guidelines on exclusionary abuses of dominance," available at https://competition-policy.ec.europa.eu/public-consultations/2024-article-102-guidelines_en

which are not "naked" but where context matters and may change the final assessment. However, these cases are expected to be welfare-decreasing in in most cases. Following Breyer's (2009) reasoning, requiring proof for every typical case is administratively costly and inefficient. Therefore, the draft Guidelines suggest reversing the burden of proof to companies which receive the option to challenge the rebuttable presumption by bringing evidence that this an exceptional case where no harm follows the conduct.[23] Both regimes of the draft Guidelines nicely follow the logic of our framework by moving abuse control within the ex-post area towards the inclusion of balanced ex-ante(-style) instruments – avoiding the pitfalls of fully transitioning to the ex-ante domain, as seen in the DMA (see Section 4.4).

The first regime, which aligns with the former guidelines and emphasizes a case-by-case approach with the administrative burden placed on the enforcer, is particularly relevant to pricing abuses and their effects. In this context, the Commission obviously assesses the economic knowledge to be so unclear or ambiguous – or better: sensitive to case circumstances – that the purest ex-post approach without any presumptions or regulation-style elements remains the primary choice. While this may be debatable from an economic point of view, given the dynamic deficits of the underlying as-efficient-competitor framework (see, inter alia, Heiden et al. 2023; Budzinski & Stöhr 2024), it follows the logic of our framework if it reflects the Commission's assessment of such cases.[24]

5. Mergers & Acquisitions

5.1 Evolution of Ex-Ante Control in the EU

The ex-ante control of mergers has become the norm within the EU, though it was introduced relatively late, in 1989. This approach was formalized with the adoption of the EU Merger Regulation (Council Regulation (EEC) No 4064/89), which came into effect on September 21, 1990 (European Commission, 1989). The regulation was subsequently revised and replaced by Council Regulation (EC) No 139/2004 on January 20, 2004, to further refine and strengthen the EU's merger control framework (European Commission, 2004). The approach of compulsory[25]

[23] For perspectives supporting rebuttable presumptions, see Baker and Shapiro (2008), Budzinski (2010), and Farrell and Shapiro (2010). However, for a more skeptical approach, refer to Akman et al. (2024).

[24] For the sake of completeness, it should be noted that another line of criticism highlights the continued neglect of exploitative abuses; see Bougette et al. (2023) and Budzinski & Stöhr (2024).

[25] There also exists a voluntary merger notification regime. Countries such as Australia, Chile, and the UK have no legal rule requiring pre-merger notification. For a comparison between compulsory and voluntary notification regimes, see Choe & Shekhar (2010).

pre-merger notification is widely regarded as offering the most robust guarantees for preserving competition and providing legal certainty for firms (Baer, 1997; Lyons, 2004; Monti, 2007). Despite these benefits, ex-ante control necessitates decision-making under conditions of imperfect information, which introduces a level of uncertainty into the regulatory process (Whish & Bailey, 2021).

5.2 Comparative Perspectives: US and UK

The adoption of ex-ante control is not a historical constant, as illustrated by the American and British procedures, which predominantly rely on ex-post actions by public authorities. In the United States, the primary legal framework for merger control is the Clayton Act of 1914, particularly Section 7, which prohibits mergers and acquisitions where the effect may be substantially to lessen competition or tend to create a monopoly (Whinston, 2007). The enforcement is primarily handled by the Federal Trade Commission (FTC) and the Department of Justice (DOJ), which can challenge mergers post-completion if they are found to be anti-competitive (Baer, 1996).[26] Since the enactment of the Hart-Scott-Rodino Antitrust Improvements Act of 1976 (the HSR Act), a premerger notification system has been introduced.

In the UK, merger control is governed by the Enterprise Act 2002, empowering the Competition and Markets Authority (CMA) to investigate and intervene in mergers meeting certain thresholds, through both ex-ante and ex-post mechanisms (CMA, 2021). While information may be somewhat more evenly distributed in these ex-post systems, the associated costs are significantly higher for firms. These companies face the risk of being forced to unmerge or divest assets, which can be financially and operationally disruptive (Baker & Shapiro, 2008; Kwoka, 2013).

5.3 Benefits of Ex-Ante Control

For firms, the current ex-ante approach provides significant legal certainty, as they can proceed with mergers knowing that they have been pre-approved by regulatory authorities. This legal certainty minimizes the risk of future regulatory challenges and the potential costs associated

[26] For instance, the FTC forced Chicago Bridge & Iron Company N.V., Chicago Bridge & Iron Company, and Pitt-Des Moines, Inc. to divest certain assets following a merger. The FTC found that the merger would significantly reduce competition in the markets for industrial storage tanks, which could lead to higher prices and reduced quality. As a result, the companies were required to sell off specific assets to maintain competitive market conditions (https://www.ftc.gov/legal-library/browse/cases-proceedings/0110015-chicago-bridge-iron-company-nv-chicago-bridge-iron-company-pitt-des-moines-inc-matter).

with them. For regulatory authorities, this approach allows for the prevention of competitive harm before it occurs, which is generally more effective than trying to remedy such harm after the fact (Motta, 2004). The process of “unmerging” or requiring divestitures post-merger can be problematic and difficult to achieve. In contrast to other areas of competition policy, merger control benefits from the difficulty to conduct any bigger merger or acquisition secretly (in contrast to running illegal cartels or illegal conduct). Due to the involvement of stock markets and a high number of people and stakeholders, competitive meaningful mergers and acquisitions are almost always public – and thus can be effectively made conditional to an ex-ante approval by the competition authority.

5.4 Challenges in High-Innovation Sectors

However, to make ex-ante control administratively feasible, it is essential to implement structural thresholds to avoid the need to scrutinize every merger, regardless of size. This is particularly important in sectors characterized by high innovation dynamics (Gilbert & Greene, 2015), such as pharmaceuticals, information technology, and artificial intelligence, where these structural thresholds may be less effective. While safe harbors pay tribute to the bureaucratic costs of merger control, they may create loopholes for anticompetitive mergers especially in digital markets where – due to the data-based business models – measures like monetary turnovers do not tell the true story about the relevance of the upcoming mavericks for competition intensity.

While ex-ante merger control can draw on a rich set of information about the markets and companies involved, this information relates to the past up to the present. However, merger control decisions and particularly remedies aim at the future competition process and how it shapes post-merger. In many markets, the pre-merger trajectories allow for an accurate prediction of the post-merger ones.[27] However, this is not true if mergers lead to a structural break in the competition patterns and/or the underlying industry is characterized by high and unpredictable dynamics. Here, again, the digital economy poses particular challenges to ex-ante merger control decisions, especially when it comes to define remedies. When merger decisions involve the adoption of behavioral remedies, substantial monitoring costs occur, akin to quasi-regulation (Kwoka & Moss, 2012). Still, behavioral remedies are not the only ones fraught with

[27] This is, for instance, achieved through the use of merger simulation models (Budzinski & Ruhmer, 2010). The *Notice* addresses this issue in the section on ‘market definition in specific circumstances,’ which includes cases such as ‘the presence of multi-sided platforms’ or ‘after-markets, bundles, and digital ecosystems.’

informational challenges. Structural remedies also pose a problem of adverse selection – deciding the scope of remedies, their viability, and ensuring they achieve the intended competitive outcomes (Farrell, 2003; Kaplow & Shapiro, 2007).

5.5 Recent Developments and Ex-Post Analysis

There is ongoing evolution in this area at the European level. The Commission-backed broad interpretation of Article 22 of the European Commission Merger Regulation (ECMR) could have enabled member states to refer mergers that fall below national thresholds to the European Commission, effectively lowering structural thresholds and aligning with the logic of the DMA (European Commission, 2021) if the Court of Justice had not rejected such an interpretation in its September 2024 *Illumina/Grail* Judgment.[28] Additionally, the *Towercast* ruling (Case T-615/20) by the General Court of the European Union indicates a shift towards ex-post analysis, reminiscent of the pre-1989 era and the *Continental Can*[29] logic (Gerard & Marescaux, 2023). When a concentration has not been examined ex-ante, its effects can be addressed ex-post through the lens of abuse of dominant position (Article 102 TFEU).

This potential evolution reflects the challenges of dynamic competition, especially in the digital economy. As the reliance on ex-ante analysis increases, determining the effects of a merger becomes more challenging. This difficulty is exacerbated in rapidly changing sectors such as digital markets, where market dynamics can shift significantly in short periods (Crémer et al., 2019). However, ex-post analysis presents two major issues: the appropriate time frame for such analysis – whether one month, three years, or longer – and the effective remediation of anti-competitive effects. The primary method of remediation is de-merging, which reintroduces the initial problems of cost and complexity (OECD, 2014; Kwoka & Valletti, 2021).

According to Cosnita and Tropéano (2021), shifting merger control to an ex-post framework would have complex implications for both type I and type II errors due to the information-provision effect. If a merger is either highly anticompetitive or highly procompetitive, ex-post control unambiguously reduces both types of errors, eliminating the need for a trade-off between them. However, for mergers with less pronounced anticompetitive effects, ex-post control may increase type II errors while decreasing type I errors. In this latter scenario, the

[28] Case C-611/22 *Illumina, Inc. v European Commission* (Judgment of 3 September 2024) ECLI:EU:C:2024:677.

[29] Case 6/72 Europemballage Corporation and Continental Can Company Inc. v Commission of the European Communities.

informational effect of ex-post assessment is crucial. The resulting increased evidence provision on the procompetitive effects of the merger actually makes it more challenging to ban anticompetitive mergers.

Additionally, Ormosi's (2012) empirical study highlights the strategic use of procedural suspensions in European Commission merger cases. This tactic, where merging parties delay proceedings to negotiate better settlement offers, demonstrates the complex interplay between ex-ante and ex-post controls, underscoring the need for flexible regulatory frameworks that can adapt to the strategic behaviors of firms.

Overall, while the ex-ante approach in the EU has provided significant benefits in terms of legal certainty and preemptive control, it is not without its limitations. The ongoing evolution towards a potential mix of ex-ante and ex-post approaches aims to address these limitations and adapt to the dynamic nature of modern competition, especially in highly innovative sectors. This hybrid approach may offer a more balanced framework for preserving competition while accommodating the unique challenges posed by rapid technological advancements and market changes (Petit, 2020). Considering the technological and the competitive turbulences may also lead to make mergers remedies more flexible by introducing *rendezvous* provisions allowing to adjust them to new conditions (Bary & de Bure, 2017; Bougette et al., 2023). Furthermore, Stöhr's (2024) meta-study shows that conducting ex-post analyses of merger cases can be particularly useful to derive learning effects for future ex-ante merger control decisions (instead of seeking to revise the 'old' decisions).

6. Discussion: Towards a Flexible and Hybrid Enforcement Roadmap

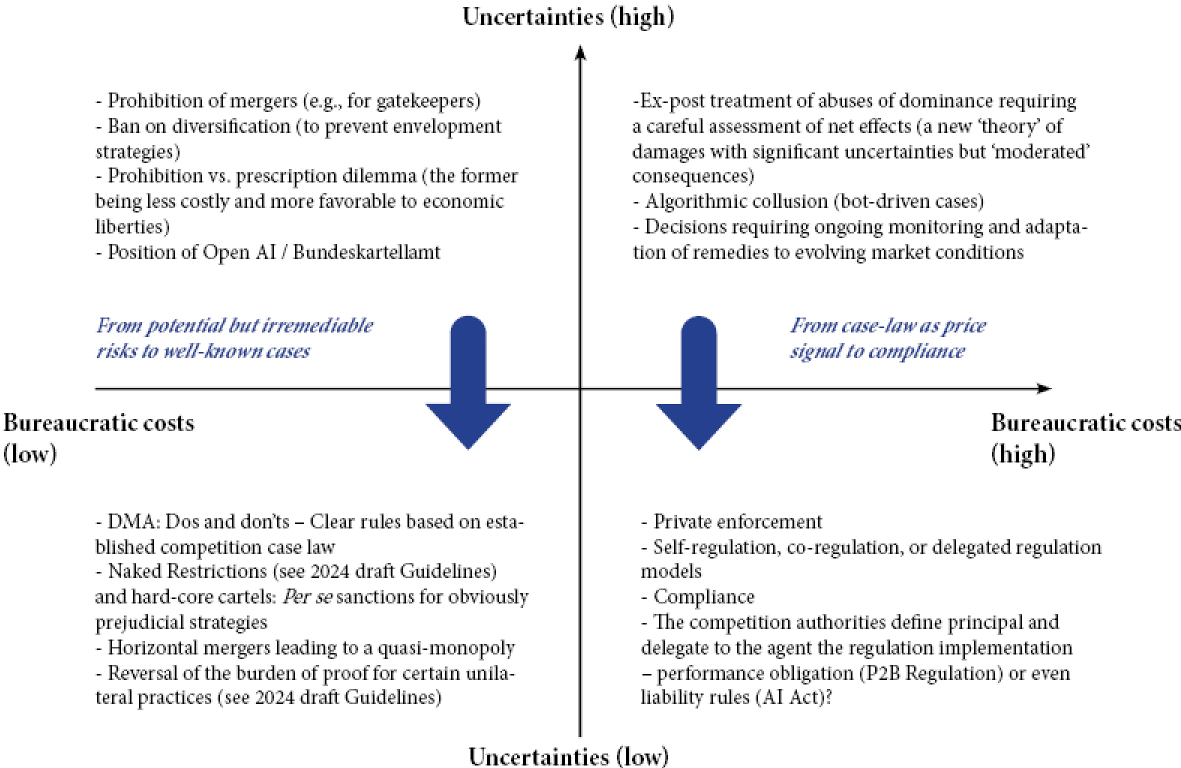
This article explores the intricate balance between ex-ante and ex-post enforcement in competition law, focusing on their respective advantages and limitations within the context of evolving market regulations. As digital transformation accelerates and technological innovations continue to disrupt traditional markets, there is a clear need for an approach that marries legal certainty with the economic realities of today's dynamic competition landscape. To safeguard the interests of all market participants and ensure economic efficiency, it is crucial to transition from a purely legalistic view to an economic analysis of the tradeoff between ex-ante and ex-post enforcement models. Establishing guidelines regarding the duration and depth of review clauses will provide the necessary robustness in enforcement, offering clarity, signals

about the compliance of individual behaviors to regulation, and consistency essential for maintaining trust and ensuring effective interventions.

Additionally, a framework that prioritizes adaptable and effective mechanisms for ex-ante evaluations is vital. Such a framework allows for preemptive adjustments crucial in rapidly evolving sectors such as technology and digital markets. Offering assurances to companies under regulation, including clear rights to appeal, ensures that the regulatory environment remains just and balanced, safeguarding the interests of businesses while promoting fair competition.

Assessing the shared costs related to regulatory flexibility is also fundamental. This involves understanding the dos and don'ts of ex-ante practices and recognizing the costs incurred both by regulatory agencies and the firms they regulate. Viewing regulatory flexibility as akin to a financial option suggests it should be appropriately valued, using a real-option model to evaluate the "social cost" of making decisions earlier on anticompetitive practices or later in the context of merger control.

Figure 2. Roadmap for Competition Regulation: Balancing Uncertainties and Bureaucratic Costs



Revisiting the roadmap from our second section allows us to reinterpret the dynamics between ex-ante and ex-post regulatory approaches. Referencing the structure of this conceptual framework (Figure 2), we identify four ideal-typical scenarios delineated by two axes: one representing the level of bureaucratic costs, the other reflecting the level of uncertainty faced by competition authorities in their decision-making processes.

Two of these scenarios lead to definitive conclusions. The first, situated in the northeast quadrant, is characterized by high administrative costs coupled with low uncertainties. This scenario aligns with the world of antitrust, where ex-post interventions follow the tort law model, addressing issues only after they arise (*ex-ante* < *ex-post* as seen in Figure 1). The second, in the southwest quadrant, features low administrative costs and low uncertainties, fitting the regulatory domain where ex-ante interventions preemptively address or avert market failures (*ex-ante* > *ex-post*). These distinct scenarios exemplify the traditional dichotomy between reactive antitrust enforcement and proactive regulatory measures.

Let us first consider the world of antitrust (northeast).

When confronted with new market practices whose effects are uncertain, an ex-post decision-making process, balancing the effects, proves more prudent. While this method incurs higher costs, it is instrumental in shaping optimal case law, leveraging information gleaned and disclosed through litigation. This strategy not only enhances flexibility – cautiously invoked through case law modifications – but also offers a practical, cost-effective route via flexible competitive remedies, including conditional measures or rendezvous clauses. Such an approach is particularly relevant in regard to abuse control à la Article 102, which deals with emerging practices, and in addressing fresh challenges under Article 101, such as algorithmic agreements that may raise concerns about tacit collusion or hub & spoke conspiracies. The current reform debate surrounding Article 102 and the enhanced abuse control instruments at the member state level (as seen in Germany) (see Section 4.6) illustrates how the pragmatic fine-tuning of ex-post approaches can incorporate elements of an ex-ante style to address the limitations of ex-post methods.

Now, let us focus on the southwest quadrant, which represents the realm of regulation. In this quadrant, bureaucratic costs are minimal and uncertainties are equally low. The consequences of practices within this quadrant are predictable, yet their impacts can be challenging to rectify after the fact. Here, an effective approach might involve ex-ante regulation, such as that seen in the DMA, which imposes specific dos and don’ts on companies. Within the regulatory framework, unlike in the antitrust context of the northeast quadrant, the approach shifts from

the rule of reason to per se analyses. While this method is particularly applicable to addressing hardcore cartels, where interventions are straightforward and preemptive (see Section 3.1), we remain more sceptical about whether the digital industries—characterized by their dynamics and creative innovations (both pro- and anticompetitive)—as targeted by the DMA, are the right arena for a relatively pure ex-ante regulatory approach (see Section 4.4).

Now let us examine the two intermediate situations.

The first intermediate scenario occurs in the northwest quadrant, where high uncertainties intersect with low administrative costs. In this quadrant, an ex-ante approach might be more effective. This could involve an antitrust regime that leans more towards per se rules rather than an effects-based approach. Preventive measures, such as prohibitions on mergers, could be implemented to thwart company strategies that may result in long-term competitive lock-ins – these are scenarios that cannot be reasonably predicted in the short to medium term. For instance, consider partnerships between major tech firms like Google, Microsoft, or Amazon with developers specializing in fundamental generative AI languages.[30] Implementing ex-ante rules, although potentially seen as a lesser evil, helps maintain the negative freedom of companies by providing clear regulatory signals and reducing legal uncertainty. This also affords regulatory authorities the necessary time to gather more information. From this point, two potential developments could unfold: one path might evolve towards a strictly ex-ante approach, typical of the southwest quadrant; the other could shift towards the northeast quadrant, favoring approaches that are more ex-post or at least reliant on analyzing effects. Due to its character as a mixed quadrant, intelligent combinations of ex-ante and ex-post elements may be particularly recommendable. For instance, while merger control should be mostly ex-ante for the outlined reasons, an addition of a systematic ex-post layer with intervention options (see Section 5.5) offers scope for combining the advantages of ex-ante and ex-post competition policy (Bougette et al., 2024).

The second intermediate situation is found in the southeast quadrant, where uncertainty is low but the cost of interventions is high. This scenario aligns with compliance-focused strategies. Here, competitive risks are well-understood, and practices are straightforward to characterize,

[30] See for instance, the position of the Bundeskartellamt on the partnership between Microsoft and OpenAI. Bundeskartellamt, (2023), *Cooperation between Microsoft and OpenAI currently not subject to merger control*, Press Release, 15 November,
https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2023/15_11_2023_Microsoft_OpenAI.html

yet enforcement remains expensive. The appropriate regulatory approach in this context involves procedural or delegated regulation (Kirat and Marty, 2015). Companies are required to establish internal procedures to prevent, detect, and mitigate risks, with their actions evaluated either based on outcome obligations or through a negligence standard.

This quadrant also incorporates risk management strategies as outlined in the AI Act,[31] as well as compliance measures that are increasingly prevalent in the enforcement of antitrust laws within the digital realm. Examples include compliance by design for algorithms or the establishment of dispute resolution mechanisms within ecosystems, as mandated by the June 2019 P2B Regulation,[32] which adopts a co-regulatory approach. Although the effects of practices are predictable, the high costs associated with monitoring, sanctioning, and remediation necessitate their externalization onto firms. Additionally, the 2014 directive supporting actions for redress aligns with this logic, as it externalizes some of the deterrence goals by facilitating follow-on actions by firms harmed by anticompetitive practices, thereby significantly reducing the procedural burden on the parties and diminishing uncertainty.

The roadmap proposed here advocates for adaptive approaches based on the acquisition of information, allowing for dynamic and responsive regulation. Implementing regulatory sandboxes and testbeds might foster experimentation, enhancing our understanding of new market behaviors and the effectiveness of regulatory responses. Flexible remedies, such as *rendezvous* clauses, should be considered to adjust enforcement actions as market conditions evolve. Delaying decision-making in cases where information may become progressively less imperfect could also help to reduce errors in regulatory judgments.

Furthermore, reforming procedural rules for abuses of dominance by avoiding overly static standards and utilizing (rebuttable) presumptions could streamline enforcement actions and raise the protection of competition as a dynamic process. Limiting ex-ante regulation to specific cases where irreversible potential damages are probable, or where excessive administrative costs associated with ex-post procedures are anticipated, can optimize resource allocation and enforcement focus.

[31] Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (AI Act) COM/2021/206 final, https://artificialintelligenceact.eu/fr/l-acte/

[32] European Union, 2019. Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services. Official Journal of the European Union, L 186, 11.7.2019, p. 57–79. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019R1150

In conclusion, adopting a hybrid approach that intelligently blends ex-ante and ex-post elements offers the flexibility required to address the challenges posed by dynamic competition and rapid technological change. This approach not only ensures that competition law remains effective and relevant but also enhances its ability to protect consumer welfare and promote fair market practices in an increasingly digital world at the benefit of ecosystems' complementors as innovative firms and SMEs.

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