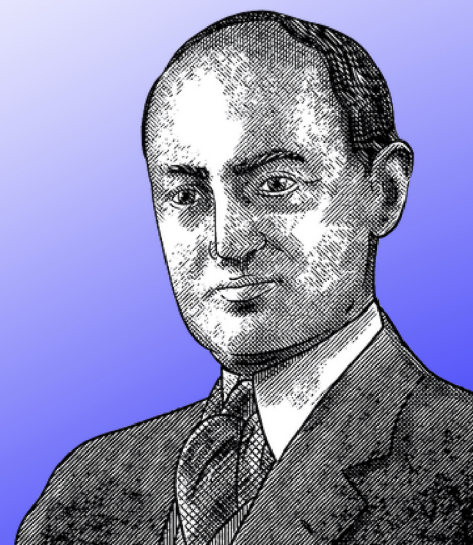


A Systematic Content Analysis of Innovation in European Competition Law

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A Systematic Content Analysis of Innovation in European Competition Law

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Abstract

Innovation plays a crucial role in defining competitive dynamics. Given this fact, one might expect ‘innovation’ to play a consistent role in antitrust law. The present article conducts a systematic content analysis of the case law of the Court of Justice of the European Union to test this hypothesis. The results suggest that EU courts assign a fragmented role to innovation in competition law cases. We end with proposals to remedy this situation.

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1. Introduction

Economies are becoming more complex, with more transactions required to produce each product.¹ This trend is attributed to the transition from an industrial to a knowledge-based economy, which relies heavily on digital innovation, i.e., information and communication technologies. Innovation plays a crucial role in defining competitive dynamics and market boundaries.²

In light of this, one might wonder about the conceptual role of ‘innovation’ in antitrust law. More specifically, is there a coherent theory of innovation in competition law cases? If so, what is the impact of this theory on competition law outcomes? Does the theory take into account all aspects of innovation, or does it discriminate between characteristics? Is the theory consistent with recent findings in the literature? If not, how does the lack of theory affect competition law outcomes? Does the literature provide guidance to courts and agencies on how to develop a unifying theory?

In order to assess the importance given to innovation in competition law, the coherence, and thoroughness of the approach, this article relies on a systematic content analysis of competition cases before EU courts (2).³ After presenting descriptive findings (3), it proceeds to an analytical study of the case law and offers some suggestions (4). The conclusion takes the form of a research agenda (5).

¹ Hausmann, Hidalgo, Bustos, Coscia, Simoes, and Yildirim, *The Atlas of Economic Complexity: Mapping Paths to Prosperity* (MIT Press, 2014), pp. 18-20; Hidalgo and Hausmann “The Building Blocks of Economic Complexity”, *Proceedings of the National Academy of Sciences of the United States of America*, Vol. 106, No. 26 (2009), pp. 10570-10575; McKinsey Global Institute (2013), “Disruptive Technologies: Advances that Will Transform Life, Business, and the Global Economy”; World Economic Forum (2018), “The Global Risks Report 2018”.

² Damanpour, “Organizational innovation: A Meta-Analysis of Effects of Determinants and Moderators”, *Academy of Management Journal*, Vol. 34, No. 3 (1991), 555-590 (innovation is positively related to firm performance); Yang, Li, and Li, “Mechanism of Innovation and Standardization Driving Company Competitiveness in the Digital Economy” *Journal of Business Economics and Management*, Vol. 24, No. 1 (2023), 54-73 (the level of innovation and standardization of a company drives its competitiveness); Geroski, “Innovation as an Engine of Competition” in Mueller, Haid and Weigand (Ed.), *Competition, Efficiency, and Welfare* (Springer, 1991), pp. 13-26; Jorde and Teece, “Antitrust Policy and Innovation: Taking Account of Performance Competition and Competitor Cooperation”, *Journal of Institutional and Theoretical Economics*, Vol. 147, No. 1 (1991), pp. 118-144; Organisation for Economic Co-operation and Development (2015), “The Innovation Imperative: Contributing to Productivity, Growth and Well-Being” (calling innovation a “key driver of economic growth and development”); Petit and Teece, Innovating Big Tech firms and competition policy: favoring dynamic over static competition, *Industrial and Corporate Change*, Vol. 30, No. 5 (2021), pp. 1168–1198.

³ General Court of the EU, and the Court of Justice of the EU.

2. Methods and processing

2.1. Systematic content analysis

The present study focuses on innovation in the case law of EU courts (the Court of Justice of the European Union, i.e., the Court of Justice and General Court). It relies on systematic content analysis (“SCA”).⁴ SCA consists of collecting a legal corpus, documenting consistent features expressed in the corpus, and drawing conclusions from them.⁵ SCA promises to bring a “useful degree of objectivity” to legal analysis. Systematic content analysis allows specialists to break down the language of legal texts and identify themes, concepts, and arguments. This analytical technique also helps to identify potential biases or inconsistencies in legal decision-making and informs efforts to improve the consistency of legal rules and standards.

SCA has long been used in competition law.⁶ However, this article is the first to apply systematic content analysis to innovation in competition law. The literature on the subject of innovation competition has developed concepts that inform the variables collected in our analysis.⁷ In return, we hope to provide the field with a database, analysis, and proposals to inform the discussion on the relationship between innovation and competition.

⁴ For example, Khemani and Shapiro, “An Empirical Analysis of Canadian Merger Policy”, *The Journal of Industrial Economics*, Vol. 41, No. 2 (1993), pp. 161-177; Gallo, Dauschmidt, Craycraft and Parker, “Department of Justice Antitrust Enforcement, 1955-1997: An Empirical Study” *Review of Industrial Organization*, Vol. 17, No. 1 (2000), pp. 75-133; Hylton and Deng, “Antitrust around the World: An Empirical Analysis of the Scope of Competition Laws and Their Effects”, *Antitrust Law Journal*, Vol. 74 (2007), pp. 271-341.

⁵ Oliphant, “A Return to Stare Decisis” *American Bar Association Journal*, Vol. 14, No. 2 (1928), pp. 71-76, 107; Hall and Wright, “Systematic Content Analysis of Judicial Opinions”, *California Law Review*, Vol. 91, No. 1 (2008), pp. 63-122 at 64.

⁶ Fernandez et al., “The Implementation of the European Commission's Merger Regulation 2004: An Empirical Analysis”, *Journal of Competition Law and Economics*, Vol. 4, No. 3 (2008), pp. 791-810; Bulmash, “An Empirical Analysis of Secondary Line Price Discrimination Motivations”, *Journal of Competition Law and Economics*, Vol. 8, No. 2 (2012), pp. 361-398; Lim, “Patent Misuse and Antitrust: Rebirth or False Dawn”, *Michigan Telecommunications and Technology Law Review*, Vol. 20, No. 2 (2014), pp. 299-390; Pinar Akman, “The Role of ‘Freedom’ in EU Competition Law”, *Legal Studies*, Vol. 34, No. 2 (2014), pp. 183-213; Or Brook, “Struggling with Article 101(3) TFUE: Diverging Approaches of The Commission, EU Courts, And Five Competition Authorities”, *Common Market Law Review*, Vol. 56 (2019), pp. 121–156.

⁷ Teece, “Understanding Big Tech Competition: Towards a Dynamic Competition Approach to Assessing Monopoly and Mergers”, forthcoming (2023); Spulber, “Antitrust and Innovation Competition”, *Journal of Antitrust Enforcement*, Vol. 10 (2022), pp. 1-57; Jorde and Teece, “Innovation and Cooperation: Implications for Competition and Antitrust”, *The Journal of Economic Perspectives*, Vol. 4, No. 3 (1990), pp. 75-96; Cleynenbreugel, “Innovation in Competition Law Analysis: Making Sense of On-Going Academic and Policy Debates” in Nihoul and Cleynenbreugel (Ed.), *The Roles of Innovation in Competition Law Analysis* (Elgar, 2018), pp. 2-12; Dolmans, “Restrictions on Innovation: An EU Antitrust Approach”, *Antitrust Law Journal*, Vol. 66, No. 2 (1998), pp. 455-485.

2.2. Case selection

Case selection should be unbiased, objective, and justified. With this objective in mind, the underlining corpus of our study relies exclusively on cases before the two EU courts. There are two main reasons for this. First, the corpus is accessible in its entirety. Second, these two courts ‘say the law.’ They do not respond to other courts higher in the hierarchy. This predominance of EU courts makes the textual analysis all the more relevant.

The present article relies exclusively on cases before EU courts that explicitly mention “innovation.” Again, two reasons explain this choice. First, this article assesses the conceptual role, if any, that EU courts assign to innovation as a stand-alone concept. Second, this case selection method allows for a clean selection of cases, as opposed to choosing which cases deal sufficiently with innovation to be included in the study.

Based on these selection criteria, we initially arrived at a corpus of 78 cases. We then excluded cases that mentioned legislative innovation(s), such as C-189/02P,⁸ which refers to “innovation in the Guidelines.” We also excluded cases that mentioned innovation once in the abstract without attempting to discuss the specifics.⁹ Thirdly, we excluded cases in which the EU courts simply quoted the European Commission’s mentions of innovation without discussing them further. We ended up with a corpus of 20 cases (2648 pages).¹⁰

⁸ Joined Cases C-189/02, C-202/02, C-205/02 to C-208/02 & C-213/02, *Dansk Rørindustri and Others v Commission*, EU:C:2005:408.

⁹ Case C-272/09, *KME Germany AG, KME France SAS and KME Italy SpA v Commission*, EU:C:2011:810.

¹⁰ Case T-175/12, *Deutsche Börse v Commission*, EU:T:2015:148; Case T-17/93, *Matra Hachette v Commission*, EU:T:1994:89; Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635; Case C-457/10, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:C:2012:770; Case T-167/08, *Microsoft Corp. v Commission*, EU:T:2012:323; Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266; Case C-12/03, *Tetra Laval BV v Commission*, EU:C:2010:280; Joined Cases C-501/06, C-513/06, C-515/06 & C-519/06, *GlaxoSmithKline Services and Others v Commission and Others*, EU:C:2009:610; Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289; Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265; Case T-210/01, *General Electric Company v Commission*, EU:T:2005:456; Case T-114/02, *BaByliss SA v Commission*, EU:T:2003:100; Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264; Judgment of 8 June 1982, *L.C. Nungesser KG and Kurt Eisele v Commission*, ECLI:EU:C:1982:211; Judgment of 13 February 1979, Case 85/76, *Hoffmann-La Roche & Co. AG v Commission*, ECLI:EU:C:1979:36; Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541; Case T-584/19, *thyssenkrupp AG v Commission*, EU:T:2022:386; Case T-612/17, *Google LLC, formerly Google Inc. and Alphabet, Inc. v Commission*, EU:T:2021:763; Case T-249/17, *Casino, Guichard-Perrachon and Achats Marchandises Casino SAS (AMC), formerly EMC Distribution v Commission*, EU:T:2020:458; and Case T-691/14, *Servier SAS and Others v Commission*, EU:T:2018:922. Several of these cases are joint cases.

2.3. Coding book

The systematic content analysis carried out in this study documents several criteria. First, the study captures the type of procedure (merger, Article 101 TFEU, Article 102 TFEU, and others). Second, it distinguishes between three main uses of innovation in the case law. EU courts consider innovation when investigating market power, i.e., whether market shares are sufficient to define dominance, whether innovative capacities can help to define dynamic dominance, etc. EU courts also study theories of harm related to innovation, i.e., whether a collusion, abuse of dominance, or merger harms competitors’ ability or incentive to innovate. Finally, EU courts consider whether an increase in innovation can justify an exemption under Article 101(3) TFEU or constitute an objective justification under Article 102 TFEU.¹¹

This study goes on to analyze the 5 *Ws* of innovation, namely, who, what, when, where, and why.

Regarding the “who,” this article documents whether EU courts focus their analysis on defendants, plaintiffs, or both. With regards to the “what,” we focus on whether EU courts are dealing with product innovation (“a product innovation is a new or improved good or service that differs significantly from the firm’s previous goods or services and that has been introduced on the market”)¹² or process innovation (“a new or improved business process for one or more business functions that differs significantly from the firm’s previous business processes and that has been brought into use in the firm”).¹³

Regarding “when,” the present article first studies whether EU courts look at innovation in the short-term (with variables that can already be computed) or long-term (with variables that are yet to appear, e.g., after a period of 3 years). We do not distinguish whether EU courts look at the effects of past practices or whether they (also) discuss the current and future effects on innovation and related incentives. EU courts discuss past and present variables to infer future effects, which would have made the distinction artificial.

In terms of “where,” a first distinction is made between digital (used as a synonym for information and communication technologies) and non-digital cases, as EU courts may attach different attributes to innovation in related sectors. A second distinction is between considerations relating to innovation

¹¹ The Treaty on the Functioning of the European Union (TFEU).

¹² OECD/Eurostat (2018), *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition*, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris/Eurostat, Luxembourg, pp. 70.

¹³ *Oslo Manual 2018 supra* note 12, pp. 72.

within the relevant market, as defined in each case, and innovation outside the relevant market. This distinction correlates with the analysis of incremental (i.e., extensions or modifications of existing products)¹⁴ or disruptive innovation (i.e., products outside the relevant market with attributes initially inferior to those of existing products).¹⁵

Finally, with regard to the “why,” this study documents whether EU courts consider the relationship between competition and innovation from an “incentive effect” or an “impact effect” perspective. The incentive effect refers to the idea that competition drives innovation (what we will call a competition-driven market, or “CDM”). The impact effect refers to the opposite idea of which innovation drives competition (which we will call an innovation-driven market, or “IDM”). We document the legal implications of these two competing conceptions of the relationship between competition and innovation. Finally, we also document whether EU courts view innovation as a survival strategy (i.e., a necessity) or as a driving strategy (i.e., leading the market or ecosystem in the desired direction).

¹⁴ Ali, “Pioneering Versus Incremental Innovation: Review and Research Propositions”, Vol. 11, No. 1 (1994) *Journal of Product Innovation Management*, pp. 46-61 at 48.

¹⁵ Larson, “Disruptive Innovation Theory: What It Is & 4 Key Concepts”, *Harvard Business School Online* (2016).

Case number	Type	Role			Who		What				When		Where				Why			
		Market power	Theory of harm	Justify practice	Defendant	Competitors	Incremental	Disruptive	Product	Process	Short-term	Long-term	Digital	Non-Digital	Within relevant market	Outside Relevant market	Incentive effect	Impact effect	Survive	Drive
Final cases																				
T-175/12 Deutsche Börse (2015)	Merger	-	+	-	+	-		+	-				-	+	+	-	+	+	-	+
T-17/93 Matra Hachette (2014)	Article 101	-	-	+	+	-	+	-	+	-	+	-	-	+	+	-	+	-	-	+
T-79/12 Cisco Systems (2013)	Merger	+	+	-	+	+	+	-	+	-	+	-	+	-	+	-	+	+	+	-
C-457/10 P AstraZeneca (2012)	Article 102	+	-	-	+	-	+	-	+	-	+	-	-	+	+	-	+	-	-	+
T-167/08 Microsoft (2012)	Contest a fine	-	-	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	-	+
T-321/05 AstraZeneca (2010) (C-457/10 P confirmed)	Article 102	+	+	-	+	-	+	-	+	-	+	+	-	+	+	-	+	+	-	+

C-12/03 P Tetra Laval (2010)	Merger	-	+	-	+	+	+	-	+	-	+	-	-	+	+	-	+	+	+	-
C-501/06 P GlaxoSmith Kline (2009)	Article 101	-	+	+	+	-	+	-	+	-	+	-	-	+	+	-	+	+	+	+
T-201/04 Microsoft (2007)	Article 102	-	+	+	+	+	+	-	+	-	+	+	+	-	+	-	+	-	-	+
T-168/01 GlaxoSmith Kline (2006) <small>(C-501/06 P confirmed)</small>	Article 101	-	+	+	+	-	+	-	+	-	+	-	-	+	+	-	+	+	+	+
T-210/01 General Electric (2005)	Merger	-	+	-	+	-	+	-	+	-	+	-	-	+	+	-	+	-	-	+
T-114/02 BaByliss (2003)	Merger	-	+	-	-	+	+	-	+	-	+	-	-	+	+	-	+	-	+	-
T-5/02 Tetra Laval (2002) <small>(C-12/03 P confirmed)</small>	Merger	-	+	-	+	+	+	-	+	-	+	-	-	+	+	-	+	+	+	-
258/78 Nungesser (1982)	Article 101	-	+	-	+	-	+	-	+	-	+	+	-	+	+	-	+	-	+	-

85/76 Hoffmann-La Roche (1979)	Article 102	+	-	-	+	-	+	-	+	-	+	-	-	+	+	-	+	-	-	+
Cases pending																				
T-604/18 Google Android (2022) (Appeal C-738/22 P pending)	Article 102	+	+	-	+	+	+	-	+	-	+	-	+	-	+	-	+	+	-	+
T-584/19 Thyssenkrupp (2022) (Appeal C-581/22 P pending)	Merger	+	-	-	+	-			+	-			-	+	+	-	+	-	-	+
T-612/17 Google Shopping (2021) (Appeal C-48/22 P pending)	Article 102	-	+	-	+	+		-	+	-	+	-	+	-	+	-	+	-	-	+
T-249/17 Casino (2020) (Appeal C-690/20 P pending)	Articles 101 & 102	-	-	-	+	-	+	-	-	+	+	-	-	+	+	-	+	-	-	+

T-691/14 Servier (2018) (Appeal C- 176/19 P & C- 201/19 P pending)	Articles 101 & 102	-	+	-	+	-					+	-	+	-	-	+	+	-	-	+	+			
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Table 1: A systematic content analysis of innovation in competition law cases before EU courts

3. Descriptive analysis

3.1. Overview

Table 1 summarizes the results of our systematic content analysis. It serves as an overview to visualize the dynamics. The variables of the coding book are documented for each individual case, wherever possible. The cases are listed according to their status – whether final or pending – and, within this, in reverse chronological order.

A tabular presentation also makes it easy to identify missing cases. Cases against Huawei Technologies, LG, Siemens, Magill, Intel, IMS Health, Qualcomm, Sun Pharmaceutical, Sony, Hitachi-LG, Toshiba Samsung, Mitsubishi Electric, Tetra Pak, and Sony are notably absent, meaning that EU courts have not explicitly attributed a conceptual role to innovation in these rulings.¹⁶

¹⁶ For a more complete list of cases in which innovation is not playing a role, see Case C-17/10, *Toshiba Corporation and Others v Úřad pro ochranu hospodářské soutěže*, EU:C:2012:72; Case C-53/85, *AKZO Chemie BV and AKZO Chemie UK Ltd v Commission*, EU:C:1986:256; Case C-98/17, P *Philips and Philips France v Commission*, EU:C:2018:774; Case C-152/19, P *Deutsche Telekom v Commission*, EU:C:2021:238; Case C-165/19, P *Slovak Telekom v Commission*, EU:C:2021:239; Case C-170/13, *Huawei Technologies v ZTE Corp. and ZTE Deutschland GmbH*, EU:C:2015:477; Case C-202/07, P *France Télécom v Commission*, EU:C:2009:214; Case C-227/14, P *LG Display and LG Display Taiwan v Commission*, EU:C:2015:258; Case C-239/11, P *Siemens v Commission*, EU:C:2013:866; Case C-307/18, *Generics (UK) and Others v Competition*, EU:C:2020:52; Case C-382/12, P *MasterCard and Others v Commission*, EU:C:2014:2201; Case C-413/14, P *Intel Corp. v Commission*, EU:C:2017:632; C-241/91 P and C-242/91 P, *Radio Telefís Éireann (RTE) and Independent Television Publications Ltd (ITP) v Commission* (‘Magill’), ECLI:EU:C:1995:98; Case C-418/01, *IMS Health GmbH & Co. OHG v NDC Health GmbH & Co. KG.*, EU:C:2004:257; Case C-431/07, P *Bouygues and Bouygues Télécom v Commission*, EU:C:2009:223; Case C-439/09, *Pierre Fabre Dermo-Cosmétique SAS v Président de l’Autorité de la concurrence and Ministre de l’Économie, de l’Industrie et de l’Emploi*, EU:C:2011:649; Case C-466/19, P *Qualcomm and Qualcomm Europe v Commission*, EU:C:2021:76; Case C-567/14, *Genentech Inc. v Hoechst GmbH and Sanofi-Aventis Deutschland GmbH*, EU:C:2016:526; Case C-586/16, P *Sun Pharmaceutical Industries and Ranbaxy (UK) v Commission*, EU:C:2021:241; Case C-611/16, P *Xellia Pharmaceuticals and Alpharma, anciennement Zoetis Products LLC v Commission*, EU:C:2021:245; Case C-697/19, P *Sony Corporation and Sony Electronics v Commission*, EU:C:2022:478; Case T-1/16, *Hitachi-LG Data Storage and Hitachi-LG Data Storage Korea v Commission*, EU:T:2019:514; Case T-8/16, *Toshiba Samsung Storage Technology and Toshiba Samsung Storage Technology Korea v Commission*, EU:T:2019:522; Case T-28/99, *Sigma Technologie v Commission*, EU:T:2002:76; Case T-110/07, *Siemens v Commission*, EU:T:2011:68; Case T-113/07, *Toshiba v Commission*, EU:T:2011:343; Case T-119/02, *Royal Philips Electronics v Commission*, EU:T:2003:101; Case T-208/13, *Portugal Telecom v Commission*, EU:T:2016:368; Case T-216/13, *Telefónica v Commission*, EU:T:2016:369; Case T-235/18, *Qualcomm v Commission*, EU:T:2022:358; Case T-286/09, *Intel v Commission*, EU:T:2022:19; Case T-328/03, *O2 (Germany) v Commission*, EU:T:2006:116; Case T-336/07, *Telefónica and Telefónica de España v Commission*, EU:T:2012:172; Case T-409/12, *Mitsubishi Electric v Commission*, EU:T:2016:17; Case T-470/13, *Merck v Commission*, EU:T:2016:452; Case T-471/13, *Xellia Pharmaceuticals and Alpharma v Commission*, EU:T:2016:460; Case T-677/14, *Biogaran v Commission*, EU:T:2018:910;

3.2. In-depth description

The final list of 20 cases includes seven merger cases, four Article 101 cases, six Article 102 cases, two cases involving both Article 101 and Article 102 issues, and one case contesting a fine. While there may be similarities between cases dealing with similar practices, the focus of the following analysis extends beyond these different categories.

• Role

EU courts assign innovation three different roles. First, six cases take innovation into account when assessing market power. Second, 15 cases focus on harm to innovation when evaluating anti-competitive effects. Third, four cases assess whether innovation can justify practices (whether under Article 101 or 102) and mergers.

Market power

There are six cases decided by EU courts that nominally address the role of innovation in the assessment of market power.¹⁷

The position of the courts has changed over the years. 85/76 Hoffmann-La Roche (1979) was the first to address the subject. As a principle, the court held that “substantial market share as evidence of the existence of a dominant position is not a constant factor and its importance varies from market to market according to the structure of these markets, especially as far as production, supply and demand are concerned.”¹⁸ The court nonetheless underlined that “very large shares are in themselves, and save in exceptional circumstances, evidence of the existence of a dominant position.”¹⁹ In other words, only when the dominant firm did not have very large market shares,

Case T-682/14, *Mylan Laboratories and Mylan v Commission*, EU:T:2018:907; Case T-701/14, *Niche Generics v Commission*, EU:T:2018:921; Case T-705/14, *Unichem Laboratories v Commission*, EU:T:2018:915; and Case T-762/15, *Sony and Sony Electronics v Commission*, EU:T:2019:515.

¹⁷ These cases logically concern mergers and Article 102 TFEU: Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266; Case C-457/10, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:C:2012:770; Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635; Case 85/76, *Hoffmann-La Roche & Co. AG v Commission*, ECLI:EU:C:1979:36; Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541; Case T-584/19, *thyssenkrupp AG v Commission*, EU:T:2022:386.

¹⁸ Case 85/76, *Hoffmann-La Roche & Co. AG v Commission*, ECLI:EU:C:1979:36, para 40.

¹⁹ Case 85/76, *Hoffmann-La Roche & Co. AG v Commission*, ECLI:EU:C:1979:36, para 41 (“Furthermore although the importance of the market shares may vary from one market to another the view may legitimately be taken that very large shares are in themselves, and save in exceptional circumstances, evidence of the existence of a dominant position”).

the innovative nature of markets mattered. And in the absence of very large market shares, the innovative nature of a market could have mitigated the market power of the dominant company, but it could have also increased it. The Court of Justice held in *Hoffmann-La Roche* (1979) that having a “technological lead” is a relevant criterion to establish a dominant position.²⁰

The principle according to which “very large market shares” can be sufficient to establish market power has been transposed on two occasions in the context of dynamic, innovative markets, first in T-321/05 *AstraZeneca* (2010)²¹ and then in C-457/10 P *Hoffmann-La Roche* (1979).²² However, the General Court has recently taken a different position. In T-342/07 *Ryanair* (2010), the GC underlined that high market shares do not indicate significant market power in innovative markets but can only serve as “useful first indications” of market power.²³ This approach is in line with paragraph 14 of the Horizontal Merger Guidelines.²⁴ The GC went further in T-79/12 *Cisco Systems* (2013)²⁵ and T-584/19 *Thyssenkrupp* (2022),²⁶ holding that “the very high market shares and very high degree of concentration on the narrow market (...) are not indicative of a degree of market power.”²⁷ Finally, in T-604/18 *Google Android* (2022), the GC held that when a market is defined by

²⁰ Case 85/76, *Hoffmann-La Roche & Co. AG v Commission*, ECLI:EU:C:1979:36, para 48 (“On the other hand the relationship between the market shares of the undertaking concerned and of its competitors, especially those of the next largest, the technological lead of an undertaking over its competitors, the existence of a highly developed sales network and the absence of potential competition are relevant factors, the first because it enables the competitive strength of the undertaking in question to be assessed, the second and third because they represent in themselves technical and commercial advantages and the fourth because it is the consequence of the existence of obstacles preventing new competitors from having access to the market”).

²¹ Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266, para 254 (“The fact, relied upon by the EFPIA, that innovation is an essential parameter of competition in the pharmaceutical sector does not call into question the relevance that must be attached to AZ’s very high market share, as assessed in its context. In this respect, it is apparent from the contested decision that AZ’s privileged position stems precisely from an innovative breakthrough by it, which enabled it to develop a new market and to have the advantageous status of first mover on that market as a result of marketing the first PPI. Furthermore, the applicants and the EFPIA do not explain how the specific features of the pharmaceutical sector are capable of negating the relevance attached to market shares”).

²² Case 85/76, *Hoffmann-La Roche & Co. AG v Commission*, ECLI:EU:C:1979:36, para 41 (“The Court has already clarified that, although the importance of the market shares may vary from one market to another, the possession, over a long period, of a very large market share constitutes in itself, save in exceptional circumstances, proof of the existence of a dominant position”). Market shares of more than 50% constitute very large market shares, see Case C-62/86 *AKZO Chemie v Commission*, EU:C:1991:286, para 60.

²³ Case T-342/07, *Ryanair v Commission* EU:T:2010:280, para 56.

²⁴ DOC52004XC0205(02), “Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings”, at p. 14.

²⁵ Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635.

²⁶ Case T-584/19, *thyssenkrupp AG v Commission*, EU:T:2022:386.

²⁷ Case T-584/19, *thyssenkrupp AG v Commission*, EU:T:2022:386, para 74.

innovation, the definition of “relevant market and dominance“ requires a “more detailed examination” than having a simple look at market shares.²⁸

Two lessons can be drawn from the case law. First, “very large market shares” are not no longer a *sufficient* condition for establishing market power in innovative industries. They have been downgraded to a *necessary* condition for the demonstration. Second, despite the call from the GC in Google Android, there are no cases that take into account the innovative nature of industries when defining the relevant markets.

Theory of harm

There are 14 cases that consider whether the practice(s) has harmed innovation.²⁹

As a principle, EU courts hold that a practice that reduces (incentives to) innovation is anti-competitive. Tetra Laval (2002) is the first identified case where harm to innovation is nominally discussed as a potential anti-competitive effect.³⁰ The principle has been confirmed in T-321/05 AstraZeneca (2010)³¹ and other cases such as T-604/18 Google Android (2022), where the General Court held that the deterrence of innovation served to establish the anti-competitive nature of the practices.³²

²⁸ Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541, para 115 (“That is particularly so in the case of markets which, as in the present case, fall within the digital economy, where traditional parameters such as the price of products or services or the market share of the undertaking concerned may be less important than in traditional markets, compared to other variables such as innovation, access to data, multi-sidedness, user behaviour or network effects”).

²⁹ Case T-175/12, *Deutsche*; Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266; Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289; Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265; Joined Cases C-501/06, C-513/06, C-515/06 & C-519/06, *GlaxoSmithKline Services and Others v Commission and Others*, EU:C:2009:610; Case T-210/01, *General Electric Company v Commission*, EU:T:2005:456; Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264; Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635; Case C-12/03, *Tetra Laval BV v Commission*, EU:C:2010:280; Case T-114/02, *BaByliss*, ECLI:EU:T:2003:100; Case 258/78, *Nungesser*, ECLI:EU:C:1982:211; Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541; Case T-612/17, *Google LLC, formerly Google Inc. and Alphabet, Inc. v Commission*, EU:T:2021:763; and Case T-691/14, *Servier SAS and Others v Commission*, EU:T:2018:922.

³⁰ Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264, para 329.

³¹ Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266, para 367.

³² Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541, para 857. See also Case T-114/02, *BaByliss*, ECLI:EU:T:2003:100, para 232 (the case discussed whether the commitment accepted by the EC further harmed innovation).

Most of the case law on this issue focuses on the standard of proof. Generally, it is not enough to provide a “basic description of the way the market might evolve” to show that the merger or practice might reduce innovation.³³ EU courts do not require that a decrease in innovation “actually manifested,”³⁴ but they do require that the likelihood (i.e., “probable effects”)³⁵ that innovation has decreased (in the case of Articles 101 and 102) or will decrease (in the case of merger control) be shown.

EU courts have repeatedly recalled that the determination of likely effects depends on the specifics. In the case of anti-competitive practices, the Court found in T-168/01 *GlaxoSmithKline* (2006)³⁶ and C-501/06 P *GlaxoSmithKline* (2009)³⁷ that parallel trade in pharmaceuticals undoubtedly led to a reduction in GSK’s ability to innovate.³⁸ In T-201/04 *Microsoft* (2007), the Court found that Microsoft harmed innovation by reducing the speed of innovation cycles and by bundling products, thereby sending signals that discouraged innovation.³⁹ In T-604/18 *Google Android* (2022), the Court found that the European Commission had successfully demonstrated that Google’s practices deprived potential or existing competitors of Google of any market,” thereby deterring innovation.⁴⁰ Here, the Court inferred the likely effects of the practice and used affirmative language that leaves no doubt as to the effect of the practice.

³³ Case T-210/01, *General Electric Company v Commission*, EU:T:2005:456, para 428 (“That basic description of the way the market might evolve, without even a brief account of those specific aspects of the project which would make such evolution likely, is not sufficient to establish that the Commission's case on this point is well founded”).

³⁴ Case T-612/17, *Google LLC, formerly Google Inc. and Alphabet, Inc. v Commission*, EU:T:2021:763, para 443 (“Nor, a fortiori, was the Commission required to demonstrate that possible consequences of the elimination or restriction of competition actually manifested themselves, for example in the form of less innovation or price increases that could only be explained by the lack of competition”).

³⁵ Case T-691/14, *Servier SAS and Others v Commission*, EU:T:2018:922, para 1179 & 1214 (“The Commission should have specified the probable effects, in particular on prices, production, quality, diversity of products or innovation (see paragraphs 1135 to 1137 above), of the ‘competitive threat’ that Krka would have continued to represent for Servier in the absence of the settlement agreement”). In Case T-612/17, *Google LLC, formerly Google Inc. and Alphabet, Inc. v Commission*, EU:T:2021:763, para 566, the General Court analyzed whether the practices were “capable” of reducing innovation.

³⁶ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265.

³⁷ Joined Cases C-501/06, C-513/06, C-515/06 & C-519/06, *GlaxoSmithKline Services and Others v Commission and Others*, EU:C:2009:610.

³⁸ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265.

³⁹ Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289, para 1088 (“Microsoft interferes with the normal competitive process which would benefit users by ensuring quicker cycles of innovation as a consequence of unfettered competition on the merits”, also, “by means of the bundling, Microsoft sends signals which deter innovation in any technologies in which it might conceivably take an interest and which it might tie with Windows in the future”).

⁴⁰ Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541, para 294 & 892.

In the case of a merger, the Court derives the (lack of) likely effects from the market context. In *Tetra Laval* (2002), for example, the Court underlined that innovation was “a practical necessity,” and that it was therefore unlikely that the merged entity would stop innovating.⁴¹ Also, according to the GC, when the dominant company makes high profits, competitors have a strong incentive to enter the market, thus reducing the likelihood that the dominant firm will stop innovating.⁴² Similarly, in innovative markets, degrading the quality of products is unlikely as it would “only accelerate the relative loss of importance” of the firm engaging in the practice.⁴³

When agencies and courts find that the *defendant* is likely to innovate less – as opposed to focusing on *competitors* – they must show that the reduction in innovation will not benefit competitors by allowing them to innovate on their own and thus gain market share.⁴⁴ For this purpose, agencies and courts must consider the link between the competitors and the dominant entity, i.e., whether there are reasons to believe that competitors would not be able to benefit from the opportunity because of existing barriers.⁴⁵ Agencies and courts cannot speculate on these foreclosure effects.⁴⁶ However, if they can show that a reduction in innovation benefits the dominant undertaking, agencies and courts are not required to quantify the reduction in innovation and/or show that the practice or merger (will) eliminate innovation altogether.⁴⁷

⁴¹ Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264, para 329.

⁴² Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264, para 329.

⁴³ Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635, para 92 (“Any attempt by the new entity to degrade the quality of its services on the narrow market will only accelerate the relative loss of importance of video communications services on Windows-based PCs”).

⁴⁴ Case C-12/03, *Tetra Laval BV v Commission*, EU:C:2010:280, para 128 (“the Commission has to show that, if there is a reduction in potential competition, this will tend to strengthen Tetra’s dominant position in relation to its competitors on the aseptic carton markets”).

⁴⁵ Case C-12/03, *Tetra Laval BV v Commission*, EU:C:2010:280, para 130 (“Accordingly, the part of the fourth ground of appeal in which the Commission claims that the potential competition is unrelated to the competitive relationship between the undertaking regarded as dominant and other undertakings active on the relevant market cannot be regarded as well founded”).

⁴⁶ Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635, para 121 (“The foreclosure effect feared by the applicants therefore depends on a series of factors in relation to which it is not certain that they might all occur in a sufficiently near future, such as is necessary in order for the prospective analysis of the effects of the concentration not to become purely speculative”).

⁴⁷ Case T-175/12, *Deutsche Börse v Commission*, EU:T:2015:148, para 168 (“there is nothing to show that the Commission should have evaluated the extent of the reduction in innovation in order to substantiate its conclusions to the requisite legal standard”) and para & 176 (The EC simply showed the merger would “lessen” incentives to innovation (as opposed to eliminate it), which was enough considering the defendant did not dispute the fact).

Justification

There are four cases in which the EU courts have considered whether an increase in innovation can justify a practice. Three concern Article 101(3) and one Article 102. Surprisingly, none concern merger decisions.⁴⁸

In order to use innovation as a valid legal defense, companies must prove to a “sufficient degree of probability” that their practice actually led to an increase in innovation.⁴⁹ “Vague, general and theoretical arguments” are not considered relevant.⁵⁰ If they can establish that likelihood, companies must then show that the innovation they introduced is more than cosmetic.⁵¹ To prove this, the General Court held in T-17/93 *Matra Hachette* (1994) that they can compare their technical improvement with the state of the art at the time the decision was taken.⁵²

Once the claim has been made, courts and agencies are required to “examine with particular attention the arguments and evidence submitted to it by the person relying on Article 81(3) EC.”⁵³ This means that courts and agencies should consider all “sufficiently relevant and substantiated” arguments put forward by companies in the context of a balancing test.⁵⁴

• Who

Defendants

There are 13 cases that focus solely on the defendant’s innovative capacity and strategies. In T-168/01 *GlaxoSmithKline* (2006), for example, the GC held that competition “is mainly concerned with parameters other than price, in particular innovation.”⁵⁵ The GC focused its analysis on *GlaxoSmithKline*’s capacity to innovate without assessing the impact on competitors. The same applies to T-321/05 *AstraZeneca* (2010), where the

⁴⁸ A likely explanation is that companies tend to focus their defence on efficiency rather than innovation.

⁴⁹ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265, para 252.

⁵⁰ Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289, para 698.

⁵¹ Case T-17/93, *Matra Hachette v Commission*, EU:T:1994:89, para 110.

⁵² Case T-17/93, *Matra Hachette v Commission*, EU:T:1994:89, para 110.

⁵³ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265, para 276, later confirmed by Joined Cases C-501/06, C-513/06, C-515/06 & C-519/06, *GlaxoSmithKline Services and Others v Commission and Others*, EU:C:2009:610.

⁵⁴ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265, para 303 & 304; also, Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289, para 709.

⁵⁵ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265, para 106.

GC recognized that “innovation is an essential parameter of competition in the pharmaceutical sector.”⁵⁶ Similarly, in merger cases such as T-175/12 *Deutsche Börse* (2015), the EC was content to show that the merger would “lessen” the parties’ incentives to innovate.⁵⁷ The EC and GC did not address the impact of the merger on the ability and desire of third parties to innovate.

Defendants and competitors

There are 6 cases in which the innovative capacity, strategy and/or current level of both competitors and defendants are taken into account. In T-5/02 *Tetra Laval* (2002), the GC held that the EC must show why, if the dominant undertaking were to innovate less, competitors “would not be able to benefit” from that situation by bringing new innovations to the market.⁵⁸ In T-201/04 *Microsoft* (2007), the GC underlined that sending signals that deter competitors from innovating is part of the theory of harm.⁵⁹ The standardization of Windows Media Player also reduced their incentive to innovate as competitors “prefer [...] if different platforms continue to compete.”⁶⁰

In C-12/03 P *Tetra Laval* (2010), the CJ ruled that in the event of a merger that reduces innovation, courts and agencies must show that the new situation strengthens the dominant position of the new entity, rather than benefiting competitors.⁶¹ In T-79/12 *Cisco Systems* (2013), the GC used the same logic – i.e., degrading the quality of products would “only accelerate the relative loss of importance” of the company because competitors would keep on innovating – to conclude that “applicants have [...] to demonstrate how the concentration might harm competition on the consumer communications market.”⁶²

In T-612/17 *Google Shopping* (2021), the EC considered the impact of Google’s practices on competitors’ incentive to innovate, knowing that they “could no longer reasonably expect sufficient traffic to compete with Google’s comparison shopping service and, if they tried to compensate for the loss of traffic from Google’s generic results by relying on paid sources of

⁵⁶ Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266, para 254.

⁵⁷ Case T-175/12, *Deutsche Börse v Commission*, EU:T:2015:148, para 176.

⁵⁸ Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264, para 330, para 330.

⁵⁹ Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289, para 1088.

⁶⁰ Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289, para 1153.

⁶¹ Case C-12/03, *Tetra Laval BV v Commission*, EU:C:2010:280, para 128 & 130.

⁶² Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635, para 94.

traffic, this would reduce the revenue available to them for innovation.” The GC upheld this reasoning, holding that “those practices are capable of foreclosing competing comparison shopping services.”⁶³ Finally, in T-604/18 *Google Android* (2022), the GC took a more technological view, highlighting that Google’s practice made it difficult for competitors to “gain search queries and the revenues and data needed to improve their services.”⁶⁴ The foreclosure of non-compatible Android forks also “strengthened Google’s dominant position on the markets for general search services and deterred innovation,” the GC said.⁶⁵

Competitors

There is only one case focusing exclusively on the innovative capacity and strategy of third parties, T-114/02 *BaByliss* (2003). The plaintiff (not a party to the merger) claimed that the commitment imposed by the EC would stifle innovation, which explains why the GC only looked at this aspect of innovative capacities. The General Court held that “technological innovation will not be impeded in so far as there is nothing to prevent the licensee from developing its own products.”⁶⁶

• What

Product innovation

There are 19 cases dealing exclusively with product innovation. None of these cases define product innovation, but they are consistent with the Oslo Manual definition, according to which “[a] product innovation is a new or improved good or service that differs significantly from the firm’s previous goods or services and that has been introduced on the market.”⁶⁷

Process innovation

Only T-249/17 *Casino* (2020) deals with business process innovation.⁶⁸ EU courts do not provide a definition of this type of innovation which the Oslo

⁶³ Case T-612/17, *Google LLC, formerly Google Inc. and Alphabet, Inc. v Commission*, EU:T:2021:763, para 451 & 566.

⁶⁴ Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541, para 294.

⁶⁵ Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541, para 892

⁶⁶ Case T-114/02, *BaByliss SA v Commission*, EU:T:2003:100, para 232.

⁶⁷ *Oslo Manual 2018 supra* note 12, pp 70.

⁶⁸ Case T-249/17, *Casino, Guichard-Perrachon and Achats Marchandises Casino SAS (AMC), formerly EMC Distribution v Commission*, EU:T:2020:458.

Manual defines as “a new or improved business process for one or more business functions that differs significantly from the firm’s previous business processes and that has been brought into use in the firm.”⁶⁹ In this case, the GC found that the information exchanged between the defendants “was very general and intended to promote, with the undertaking’s suppliers, the development and innovation policy of Intermarché’s management team.”⁷⁰ More specifically, the defendants exchanged information on the “digital transformation and expansion of on-line trade, innovations designed to speed up the placing of new products on the shelves, an increase in its ‘drive-through’ points of sale and the implementation of new promotional initiatives.”⁷¹ The practice was found to be pro-competitive.

- **When**

Short-term

There are 15 cases in which innovation is considered from a purely short-term perspective. The approach is implicit in most of these cases, where EU courts address recent events or imminent incentives to innovate, such as short-lived barriers to entry. Several of these cases make the logic explicit, one of which is T-114/02 *BaByliss* (2003). The General Court considered the impact of a two-year license on innovation.⁷² In T-79/12 *Cisco Systems* (2013), the GC held that competition authorities cannot speculate on the foreclosure effect of a merger when there is still uncertainty as to how the market will develop in the foreseeable future (i.e. three years).⁷³ The GC described a period of three years as “relatively long.”

Short and long-term

There are three cases dealing with both short and long-term innovation. In case 258/78 *Nungesser* (1982), the Court of Justice analyzed the exclusivity agreement at issue and considered that “very long periods of” stable financial commitments were necessary to promote technical innovation.⁷⁴ In case T-

⁶⁹ *Oslo Manual 2018 supra* note 12, pp 72.

⁷⁰ Case T-249/17, *Casino, Guichard-Perrachon and Achats Marchandises Casino SAS (AMC), formerly EMC Distribution v Commission*, EU:T:2020:458, para 267.

⁷¹ Case T-249/17, *Casino, Guichard-Perrachon and Achats Marchandises Casino SAS (AMC), formerly EMC Distribution v Commission*, EU:T:2020:458, para 254.

⁷² Case T-114/02, *BaByliss SA v Commission*, EU:T:2003:100, para 232.

⁷³ Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635, para 121 (“the Commission referred to a period of three years following the date of adoption of the decision. That period, which the applicants have not moreover disputed, is relatively long where, as in the present case, the sector concerned is a new technology sector which is characterised by relatively short innovation cycles”).

⁷⁴ Case 258/78, *Nungesser*, ECLI:EU:C:1982:211, para 25.

201/04 Microsoft (2007), the General Court upheld the European Commission’s argument that Microsoft’s refusal to deal had a negative impact on innovation because it prevented competitors from benefiting from their innovation. “In the longer term,” the practice thus reduced the incentives of Microsoft’s competitors to innovate.⁷⁵ Finally, in T-321/05 AstraZeneca (2010), the General Court expressed concern that granting IP rights for a longer period than the one for which they were granted would lead to a “freeze (...) counter to the public interest in encouraging innovation.”⁷⁶ The GC has also shown interest in the “free exercise of an exclusive right” in order to reward innovation.⁷⁷ The time frame here is medium to long-term.

• Where

Types of markets

There are five cases concerning innovation in digital markets: T-201/04 Microsoft (2007)⁷⁸ and T-167/08 Microsoft (2012)⁷⁹ on software products, T-79/12 Cisco Systems (2013)⁸⁰ on internet-based communications services and software, T-612/17 Google Shopping (2021)⁸¹ and T-604/18 Google Android (2022)⁸² on internet-related products and services. This means that EU courts have yet to develop a well-established jurisprudence on innovation in digital markets.

Six cases involve pharmaceutical companies: 85/76 Hoffmann-La Roche (1979)⁸³ deal with a manufacturer of bulk vitamins, T-168/01 GlaxoSmithKline (2006)⁸⁴ and C-501/06 P GlaxoSmithKline (2009)⁸⁵ with a manufacturer of pharmaceutical products, T-321/05 AstraZeneca (2010)⁸⁶ and C-457/10 P AstraZeneca (2012)⁸⁷ with a pharmaceutical group, and T-691/14 Servier (2018)⁸⁸ with a pharmaceutical company.

⁷⁵ Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289, para 636.

⁷⁶ Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266, para 367.

⁷⁷ Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266, para 679.

⁷⁸ Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289.

⁷⁹ Case T-167/08, *Microsoft Corp. v Commission*, EU:T:2012:323.

⁸⁰ Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635.

⁸¹ Case T-612/17, *Google LLC, formerly Google Inc. and Alphabet, Inc. v Commission*, EU:T:2021:763.

⁸² Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541.

⁸³ Case 85/76, *Hoffmann-La Roche & Co. AG v Commission*, ECLI:EU:C:1979:36.

⁸⁴ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265.

⁸⁵ Joined Cases C-501/06, C-513/06, C-515/06 & C-519/06, *GlaxoSmithKline Services and Others v Commission and Others*, EU:C:2009:610.

⁸⁶ Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266.

⁸⁷ Case C-457/10, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:C:2012:770.

⁸⁸ Case T-691/14, *Servier SAS and Others v Commission*, EU:T:2018:922.

The other nine cases concern other sectors: 258/78 *Nungesser* (1982)⁸⁹ on food and feed, T-17/93 *Matra Hachette* (1994)⁹⁰ on car manufacturing process, T-5/02 *Tetra Laval* (2002)⁹¹ and C-12/03 P *Tetra Laval* (2010)⁹² on packaging, T-114/02 *BaByliss* (2003)⁹³ with electrical household appliances (beauty aids), T-210/01 *General Electric* (2005)⁹⁴ and T-584/19 *Thyssenkrupp* (2022)⁹⁵ on an industrial group, T-175/12 *Deutsche Börse* (2015)⁹⁶ on financial markets, and T-249/17 *Casino* (2020)⁹⁷ on food and non-food distribution sector. Here also, these are too few cases for a theory of innovation to emerge.

Relevant markets

All 20 cases deal with innovation in the relevant market. They picture innovation as incremental improvements. None of these cases consider innovation outside the relevant market. Disruptive innovation is therefore absent from the decision-making of EU courts.

Several examples are particularly telling. In T-612/17 *Google Shopping* (2021), both the Commission and General Court focused on whether Google’s practice would reduce innovation in “competing comparison shopping services.”⁹⁸ Similarly, in T-604/18 *Google Android* (2022), both the Commission and General Court emphasized that the practice reduced the incentive for “other search services” to innovate.⁹⁹ The same logic applies in merger cases. In T-114/02 *BaByliss* (2003), the Court focused on technological innovation aimed at replacing the merging parties’ products.¹⁰⁰ Finally, in T-5/02 *Tetra Laval* (2002), the Court held that the ability of direct competitors to innovate should be taken into account in competition agencies’ decisions.¹⁰¹ No mention is made of indirect competitors.

⁸⁹ Case 258/78, *Nungesser*, ECLI:EU:C:1982:211.

⁹⁰ Case T-17/93, *Matra Hachette v Commission*, EU:T:1994:89.

⁹¹ Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264.

⁹² Case C-12/03, *Tetra Laval BV v Commission*, EU:C:2010:280.

⁹³ Case T-114/02, *BaByliss*, ECLI:EU:T:2003:100.

⁹⁴ Case T-210/01, *General Electric Company v Commission*, EU:T:2005:456.

⁹⁵ Case T-584/19, *thyssenkrupp AG v Commission*, EU:T:2022:386.

⁹⁶ Case T-175/12, *Deutsche Börse v Commission*, EU:T:2015:148.

⁹⁷ Case T-249/17, *Casino, Guichard-Perrachon and Achats Marchandises Casino SAS (AMC), formerly EMC Distribution v Commission*, EU:T:2020:458.

⁹⁸ Case T-612/17, *Google LLC, formerly Google Inc. and Alphabet, Inc. v Commission*, EU:T:2021:763, para 566.

⁹⁹ Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541, para 294.

¹⁰⁰ Case T-114/02, *BaByliss*, ECLI:EU:T:2003:100, para 239 (“Consequently technological innovation will not be impeded in so far as there is nothing to prevent the licensee from developing its own products to complement those purchased from SEB with a view to replacing the appliances supplied by SEB, taking account of the short duration of the commitment in question”).

¹⁰¹ Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264, para 330 (“No explanation whatsoever is given of why Tetra’s competitors, particularly SIG, ‘its main

• **Why**

Incentive effect

There are 11 cases in which EU courts approach the relationship between competition and innovation from a strict “incentive effect”¹⁰² perspective according to which competition drives (i.e., creates incentives for) innovation.¹⁰³ These cases thus concern competition-driven markets (“CDM”).

This approach is made explicit in a number of these cases, the first of which is 258/78 Nungesser (1982). The EC argued that “[a] certain degree of competition must be maintained in order that other innovations by other undertakings may be encouraged,” a logic that the GC did not dispute.¹⁰⁴ In T-201/04 Microsoft (2007), the GC explicitly upheld the EC’s argument that a reduction in competition is tantamount to a reduction in the capital invested in innovation.¹⁰⁵ Finally, in T-612/17 Google Shopping (2021), the GC held that the demonstration of a reduction of competition is sufficient to show that innovation is “highly likely” to be reduced.¹⁰⁶

Impact effect¹⁰⁷

There is one case that considers the market as innovation-driven (“IDM”), i.e., that considers the relationship between competition and innovation from a strict “impact effect” perspective,¹⁰⁸ T-691/14 Servier (2018). The EC expressed concern about practices “contributing to the decline in innovation.”¹⁰⁹ The GC held that where innovation matters to users and thus primarily defines competition, the EC cannot argue the absence of competitive constraints by looking only at prices.

competitor’ (recital 400), with a market share of [10-20%] (recital 218), could not benefit from a decision by the merged entity to innovate less”).

¹⁰² Aghion, Bechtold, Cassar and Herz, “The Causal Effects of Competition on Innovation: Experimental Evidence” *NBER Working Paper* (2014), pp. 1-31.

¹⁰³ Teece, op. cit. *supra*, note 7.

¹⁰⁴ Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264, para 2047-2048.

¹⁰⁵ Case T-201/04, *Microsoft Corp. v Commission*, EU:T:2007:289, para 1088.

¹⁰⁶ Case T-612/17, *Google LLC, formerly Google Inc. and Alphabet, Inc. v Commission*, EU:T:2021:763, para 443.

¹⁰⁷ Katz and Shelanski, “Mergers and Innovation” *Antitrust Law Journal*, Vol. 74, No. 1 (2007), pp. 1-85 at 12 & 13.

¹⁰⁸ Geroski, op. cit. *supra* note 2; Jorde and Teece, op. cit. *supra* note 2; Petit and Teece, op. cit. *supra* note 2.

¹⁰⁹ Case T-691/14, *Servier SAS and Others v Commission*, EU:T:2018:922, para 62.

Incentive and impact effects

Finally, there are seven cases that consider both the incentive and impact effects. The first is T-5/02 *Tetra Laval* (2002), in which the GC held that since “innovation is a practical necessity,” it is unlikely that the merged entity “would be less inclined to continue investing in any innovation” even though competitive pressure might be reduced.¹¹⁰ In T-168/01 *GlaxoSmithKline* (2006), one of the most interesting cases in this respect, the GC first underlined that competition in the relevant market was “mainly concerned with parameters other than price, in particular innovation.”¹¹¹ The GC went on to say that “the medicines sector is characterized by the importance of competition by innovation,”¹¹² before stating that the EC has to choose between “incentive effect” and “impact effect” when assessing Article 101 TFEU.¹¹³ As “competition by innovation is very fierce in the sector,” and “competition on price” exists in parallel, the GC held that it was necessary to “assess what form of competition must be given priority with a view to ensuring the maintenance of effective competition.”¹¹⁴ C-501/06 P *GlaxoSmithKline* (2009) confirmed the GC’s view.¹¹⁵

In T-321/05 *AstraZeneca* (2010), the GC called a practice that reduces innovation anti-competitive.¹¹⁶ In C-12/03 P *Tetra Laval* (2010), the CJ held that courts and agencies must show how reduced competitive pressure could lead to less innovation; they cannot simply postulate the fact.¹¹⁷ In case T-79/12 *Cisco Systems* (2013), the GC upheld the EC’s argument that innovation is a key driver of competition in fast-growing markets.¹¹⁸ In T-175/12 *Deutsche Börse* (2015), the GC makes both the incentive and impact effects explicit, stating that companies do not compete only “in terms of product innovation or that the competition between the parties to the concentration was the only driver of new product development.”¹¹⁹ Finally, the GC recognized in T-604/18 *Google Android* (2022) that stifling innovation harms competition (impact effect), and that competition encourages innovation for the benefit of consumers (incentive effect).¹²⁰

¹¹⁰ Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264, para 329.

¹¹¹ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265, para 106.

¹¹² Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265, para 271.

¹¹³ Demsetz, *The Economics of the Business Firm: Seven Critical Commentaries*, (Cambridge, 1997), pp. 143: “It is senseless to claim that a policy that increases the intensity of one form of competition also raises the general level of competition if, as a consequence, the intensity of another form of competition is reduced.”

¹¹⁴ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265, para 315.

¹¹⁵ Joined Cases C-501/06, C-513/06, C-515/06 & C-519/06, *GlaxoSmithKline Services and Others v Commission and Others*, EU:C:2009:610.

¹¹⁶ Case T-321/05, *AstraZeneca AB and AstraZeneca plc v Commission*, EU:T:2010:266, para 679.

¹¹⁷ Case C-12/03, *Tetra Laval BV v Commission*, EU:C:2010:280, para 128.

¹¹⁸ Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635, para 52.

¹¹⁹ Case T-175/12, *Deutsche Börse v Commission*, EU:T:2015:148, para 163.

¹²⁰ Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541, para 1028.

• **Why**

Survive

There are 6 cases that deal with innovation solely as a survival necessity.

When innovation is a necessity for survival, courts and authorities focus less on incentives to innovate and more on barriers to innovation. This means that they focus their analysis on whether innovation has been maintained despite the anti-competitive practice or will be maintained despite the merger. If competitors are able to maintain innovation, the need to innovate in order to survive creates a strong enough incentive.

In 258/78 *Nungesser* (1982),¹²¹ T-5/02 *Tetra Laval* (2002),¹²² T-114/02 *BaByliss* (2003),¹²³ C-12/03 P *Tetra Laval* (2010),¹²⁴ T-79/12 *Cisco Systems* (2013),¹²⁵ T-691/14 *Servier* (2018),¹²⁶ the GC and CJ focused on barriers to innovation (reasons why innovation would be “prevented”), in line with the finding that innovation is indeed a necessity that can be impeded but not diminished.

Drive

There are 14 cases that deal with innovation solely as a driving strategy to influence the market. Here, companies are not required to innovate in the short term in order to survive. Courts and agencies logically study the impact of practices and mergers on *incentives* to innovate (and degrees of

¹²¹ Case 258/78, *Nungesser*, ECLI:EU:C:1982:211, para 25.

¹²² Joined Cases T-5/02 & T-80/02, *Tetra Laval BV v Commission*, EU:T:2002:264, para 330 (“The reference by the Commission at the hearing to the high costs of innovation on the relevant markets, although pertinent and probably correct, cannot by itself justify its finding that Tetra’s competitors would not be able to benefit from a decision by the merged entity to innovate less”).

¹²³ Case T-114/02, *BaByliss SA v Commission*, EU:T:2003:100, para 232 (“Consequently technological innovation will not be impeded in so far as there is nothing to prevent the licensee from developing its own products to complement those purchased from SEB”).

¹²⁴ Case C-12/03, *Tetra Laval BV v Commission*, EU:C:2010:280, para 128 (“The Court of First Instance was therefore right to state, in paragraph 323 of the judgment under appeal, in connection with the discussion and assessment of the parties’ arguments in that regard, that the Commission has to show that, if there is a reduction in potential competition, this will tend to strengthen Tetra’s dominant position” because of barriers).

¹²⁵ Case T-79/12, *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635, para 94 (by not exposing barriers to innovate, “[i]t follows that the applicants have failed to demonstrate how the concentration might harm competition on the consumer communications market”).

¹²⁶ Case T-691/14, *Servier SAS and Others v Commission*, EU:T:2018:922, para 1578 (“when innovation matters to users, the EC cannot show the absence of competitive constraints simply looking at prices”, the EC must establish barriers to innovate).

innovation), as these incentives can be lowered without immediate exclusionary effects. In T-175/12 *Deutsche Börse* (2015), the GC held that it was sufficient to show that the merger would “lessen” incentives to innovate (as opposed to eliminate innovation).¹²⁷ T-612/17 *Google Shopping* (2021)¹²⁸ and T-604/18 *Google Android* (2022) similarly focus on incentives to innovate.¹²⁹

Survive and drive

There are two cases, T-168/01 *GlaxoSmithKline* (2006) and C-501/06 P *GlaxoSmithKline* (2009), which deal with innovation as both a survival necessity and a driving strategy. On the one hand, the GC recognised that competition in the market is mainly driven by innovation, i.e., a company with little innovation is unlikely to survive the competitive process.¹³⁰ On the other hand, price competition becomes the main determinant of *survival* when “manufacturers of generic medicines are able to enter the market.”¹³¹ Once they have entered, innovation becomes a *driving* strategy to move the market in a new direction (i.e., with a new drug). The GC described¹³² the competition assessment in this case as “complex”¹³³ because it requires an analysis of barriers and incentives to innovation.

4. Lessons learned and proposals

The systematic content analysis presented in this article leads to some general observations (4.1.) and related proposals (4.2.). The overall objective is to contribute to a theory of innovation in EU competition law that is applied with more consistency and take more parameters into account.

¹²⁷ Case T-175/12, *Deutsche Börse v Commission*, EU:T:2015:148, para 176.

¹²⁸ Case T-612/17, *Google LLC, formerly Google Inc. and Alphabet, Inc. v Commission*, EU:T:2021:763, para 566.

¹²⁹ Case T-604/18, *Google and Alphabet v Commission (Google Android)*, EU:T:2022:541, para 294.

¹³⁰ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265, para 106 & 255.

¹³¹ Case T-168/01, *GlaxoSmithKline Services Unlimited v Commission*, EU:T:2006:265, para 315.

¹³² Joined Cases C-501/06, C-513/06, C-515/06 & C-519/06, *GlaxoSmithKline Services and Others v Commission and Others*, EU:C:2009:610, para 271.

¹³³ Joined Cases C-501/06, C-513/06, C-515/06 & C-519/06, *GlaxoSmithKline Services and Others v Commission and Others*, EU:C:2009:610, para 308.

4.1. Main findings

Two main findings emerge from our analysis of case law.

First, EU courts do not generally show a coherent theory of innovation.¹³⁴ There are two reasons for this. One, EU courts do not always assess the same parameters of innovation in similar situations. The General Court only considers the long term in three cases, one in digital technology, one in pharmaceuticals, and one in seed production. Moreover, the innovative capacity (and innovation track record) of competitors is only addressed in seven cases, although this parameter is relevant to competition in most situations. Finally, EU courts consider the incentive effect and/or the impact effect without a discernible pattern. Second, EU courts do not always give the same weight to innovation. Market power analysis is a good example of this tendency. 85/76 Hoffmann-La Roche (1979) first considered innovation (innovative capacities) as a potential factor that could strengthen a dominant position. This approach does not recur in the case law. In fact, EU courts have then excluded innovation from the analysis in cases of “very large market shares.” Only in 2010 did the General Court reintroduce the analysis of innovation to define dominance in dynamic markets, irrespective of market shares.

Second, the consistency shown by EU courts in certain parts of the analysis is commendable but incomplete. On the one hand, EU courts should be praised for systematically considering several important parameters of innovation. For example, EU courts systematically examine barriers to innovation when innovation is a survival necessity. EU courts systematically examine incentives to innovate when innovation is a driver of market dynamics. When assessing harm to innovation, EU courts do not require the harm to be quantified. The likely effects are sufficient. When analyzing whether innovation can justify a practice, EU courts impose an equivalent standard by requiring a “sufficient degree of probability” that innovation will increase as a result of the practice. Finally, when EU courts find that a practice or merger (will) reduce the defendant’s innovation, they consistently ask why third parties would not benefit from the situation. On the other hand, EU courts systematically ignore important parameters of innovation. First, EU courts have systematically ignored innovation when defining the relevant market. Second, EU courts have not considered innovation outside of the relevant market. Third, the same courts have consistently ignored disruptive

¹³⁴ Let us keep in mind that EU courts are bound by the arguments made by the parties.

innovation. And fourth, EU courts almost always (with one exception) ignore process innovation.¹³⁵

4.2. Proposals

A number of proposals follow from our findings. Before presenting them, let us recall that 20 cases is a small number. There is much to build when it comes to the relationship between innovation and competition.¹³⁶ With this in mind, we recommend that EU courts *and* competition agencies work together to implement a coherent and complete theory of innovation in EU competition law.

Proposals		
Market definition	Market power	Market strategies
As a principle, always take innovation into account when defining the relevant market	Create a framework per industry to balance the importance of market share and innovation in assessing the defendant’s market power	Adopt an ecosystem view that systematically consider access to infrastructures, assets, and skills in innovation-driven-markets
Systematically consider the innovative nature of industries when defining the relevant market	Systematically address competitors’ ability and incentives to innovate in fast-moving industries	Consolidate the analysis of harm to innovation by considering new offenses and strengthening the legality test
Systematically consider innovation (and innovative dynamics) outside of the relevant market	Systematically assess the capacity of the defendant and its competitors to innovate by factoring in past dynamics and current indicators	Systematize innovation improvements as a valid justification for innovation-driven-markets
Systematically consider the likelihood that disruptive innovation may affect market definition	/	/

¹³⁵ Case T-249/17, *Casino, Guichard-Perrachon and Achats Marchandises Casino SAS (AMC), formerly EMC Distribution v Commission*, EU:T:2020:458, para 267.

¹³⁶ Our findings contrast with the rationale behind the Digital Markets Act, which states that “enforcement experience under EU competition rules” is sufficient to establish a list of prohibited practices in order to, among other objectives, “protect innovation.” 20 cases dealing explicitly with innovation and only five cases dealing with digital markets at the EU court level is not much experience.

• **Market definition**

The first set of proposals relates to market definition. As a general principle, EU courts and agencies should systematically take innovation into account when defining the relevant market, whether in merger or Article 102 cases. Relevant markets are generally defined using static parameters that do not well reflect competitive pressures and market dynamics.¹³⁷ Adding innovation to the list of systemic factors will help mitigate this static issue.

More specifically, taking innovation into account means integrating three elements into market definition. *First*, EU courts and agencies should systematically document and communicate, for each industry, the importance of innovation as a driver of competition. They can document this variable by drawing on the empirical evidence available in the literature or by conducting their own studies. This will lead to a better understanding of collisions between relevant markets to the extent that innovation typically results from the combination of existing technologies.¹³⁸

Second, we recommend that EU courts and agencies consider innovation outside the relevant market. Specifically, a broader substitutability test should be used to take into account existing competitive pressure from complementors on their host platform (vertically) and rapidly developing non-substitutes (horizontally).¹³⁹ These elements should be documented in the agencies’ decisions.

Third, the relevant market definition should take into account the impact of potentially disruptive innovations on market boundaries. The focus on incremental, in-market innovation implies a lack of dynamism in the assessment of practices and mergers. As W. Brian Arthur explains, innovation occurs through the combination of existing technologies.¹⁴⁰ Disruption

¹³⁷ Christopher Pleatsikas & David Teece, “The Analysis of Market Definition and Market Power in the Context of Rapid Innovation”, *International Journal of Industrial Organization*, Vol. 19, No. 5 (2001), pp. 665-693 (calling market definition “inherently static”); Rupprecht Podszun, “The Arbitrariness of Market Definition and an Evolutionary Concept of Markets”, *The Antitrust Bulletin*, Vol. 61, (2016) (current approaches to market definition “have an in-built bias towards a static snapshot understanding of the economy”); Keith N. Hylton and Haizhen Lin, “Optimal Antitrust Enforcement, Dynamic Competition, And Changing Economic Conditions”, *Antitrust Law Journal*, Vol. 77, No. 1 (2010), pp. 247-276, at 264 (arguing that in innovative markets, courts should “err on the side of the broader market definition with more substitutes”).

¹³⁸ Arthur, *The Nature of Technology: What It Is and How It Evolves*, (Free Press, 2009), pp. 2 & 20.

¹³⁹ Adner and Lieberman, “Disruption Through Complements”, *Strategy Science*, Vol. 6, No. 1 (2021), pp. 91-109.

¹⁴⁰ Arthur, *op. cit. supra* note 138. See also Arthur and Polak, “The Evolution of Technology Within a Simple Computer Model” *Complexity*, Vol. 11, No. 5. (2006); Atzori, Iera and

follows. Recent examples include Web3 competing with Web2 through a combination of cryptographic tools and decentralized digital architectures.¹⁴¹ Another is ChatGPT, which competes with Google search by combining deep learning with new computational capabilities. The mere possibility of these two disruptive innovations is not covered by EU competition law in its current form. T-612/17 Google Shopping (2021) and T-604/18 Google Android (2022) leave no room in the analysis for possible disruption, being Web3 or ChatGPT. This means that EU courts cannot engage in an important discussion about the weight they want to give to the possibility of disruption.¹⁴²

• Market power

The second set of proposals concerns the assessment of market power. *First*, the analysis of the defendant’s market power should be modulated by innovation in the industry. Cases that already consider innovation when defining market power simply mention the competitive pressure created by innovation, but do not attempt to quantify this pressure or, at least, to provide a framework for analyzing the impact effect depending on the industry.¹⁴³ EU courts and agencies should consolidate the findings of T-604/18 Google Android (2022) according to which high market shares are a necessary but insufficient condition for defining market power. They should create a framework for assessing the importance of market shares in the analysis. In fast-moving industries, for example, market shares capture very little of the uncertainty in the market. They are poor predictors of competitive pressure.¹⁴⁴

Morabito, “The Internet of Things: A Survey”, *Computer Networks*, Vol. 54, No. 15 (2010), Pages 2787-2805; Yoo, Boland Jr., Lyytinen and Majchrzak, “Organizing for Innovation in the Digitized World”, *Organization Science*, Vol. 23, No. 5 (2012), pp. 1398-1408; Boland Jr, Lyytinen and Yoo, “Wakes of innovation in project networks: The Case of Digital 3-D Representations in Architecture, Engineering, and Construction”, *Organization Science* Vol. 18, No. 4 (2007), pp. 631-647; Lessig, *Remix: Making Art and Commerce Thrive in the Hybrid Economy*, (Penguin, 2008); Baldwin and Clark, *Design Rules: The Power of Modularity*, Vol. 1 (MIT, 2000); Schilling, “Toward a General Modular System Theory and its Application to Inter-Firm Product Modularity”, *Academy of Management Review*, Vol. 25, No. 2 (2000), pp. 312-334.

¹⁴¹ Schrepel, *Blockchain + Antitrust: The Decentralization Formula* (Elgar, 2021), pp. 18-37.

¹⁴² See Yoo, “Computing in Everyday Life: A Call for Research on Experiential Computing”, *Management Information Systems Quarterly*, Vol. 34, No. 2 (2010), pp. 213—231 (the boundaries of a product are unknowable where there is a sufficient degree of modularity).

¹⁴³ Despite being recognized as a main reality by the EC, highlighting that “[i]nnovation constitutes an essential and dynamic component of an open and competitive market economy”, point 7 of DOC52014XC0328(01), “Communication from the Commission — Guidelines on the application of Article 101 of the Treaty on the Functioning of the European Union to technology transfer agreements”, p. 226.

¹⁴⁴ Petit and Schrepel, “Complexity-Minded Antitrust”, *Journal of Evolutionary Economics* (2023) (presenting a new paradigm, “Complexity <—> Uncertainty <—> Competition”).

Second, the analysis of competitors’ capacity and ability to innovate should be integrated whenever relevant, i.e., in fast-moving industries. Surprisingly, too few cases engage in this analysis. Mergers and acquisitions, for example, can create incentives for competitors to innovate in order to keep up. They can also affect the ability of competitors to innovate if the merged firm access critical infrastructure. This explains why the innovation capabilities of competitors should not be ignored. Looking at fast-moving industries through the lens of complexity theory will help remedy this shortcoming by pushing EU courts and agencies to consider the interconnectedness between layers and actors of the ecosystem.¹⁴⁵

Third, the analysis of the defendant’s market power and the innovative capacity of competitors must take into account dynamics over time. At a macro level, this means that the analysis should focus on past dynamics and current indicators. The fluctuation of market shares in recent years, the number of significant market entries, the frequency of disruptive technologies, and whether the market has recently untipped should help to assess dominance. Similarly, an analysis of the current state of the art, the combinatorial potential of key technologies, the number of patent registrations, the level of R&D investment, access to finance through the venture capital market, and the nature of market exits should assist the agencies in defining market uncertainty, as they suggest possible breakthroughs in the medium to distant future. These elements should then feed into the assessment of market power.

At the micro level, this also means that EU courts and agencies should consider the defendant’s innovation track record, whether it has significant innovation capabilities, and whether it withholds critical infrastructure for other firms to innovate. The same analysis should be systematically applied to competitors. Only if the dominant company has been and can be successful without innovating because it can introduce strong feedback loops and thus control or influence competitors’ innovation, should EU courts and authorities find clear evidence of market power despite low market shares. Conversely, having a technological lead, an impressive track record, or important innovation capabilities, but not the ability to thrive without innovation, should remain irrelevant to a finding of dominance.¹⁴⁶

¹⁴⁵ Petit and Schrepel, op. cit. *supra* note 144.

¹⁴⁶ Our recommendation contradicts the Court holding in Case 85/76, *Hoffmann-La Roche & Co. AG v Commission*, ECLI:EU:C:1979:36, para 48.

- **Market strategies**

The third set of proposals concerns the assessment of market strategies, broadly defined as mergers and anti-competitive practices. *First*, our findings suggest that EU courts and agencies should systematically adopt an ecosystem view (i.e., looking at a stack of different interacting layers) when assessing harm to innovation in mergers and acquisitions. This will lead them to better understand and protect IDMs by preventing harm to innovation and allowing innovation-enhancing mergers. More specifically, EU courts and agencies should shift their attention away from the demand side to upstream activities.¹⁴⁷ In the abstract, they could do this by first defining what access to infrastructure, assets, and skills are needed to innovate on the supply side. EU courts and agencies should then assess these elements in each case.

In practice, we recommend that EU courts and agencies analyze whether the merger will impact access to the *infrastructures* necessary for a product to function efficiently, such as cloud solutions, computational power, hosting services, repositories, communication protocols, etc. EU courts and agencies should also assess whether the merger will change access to the infrastructures helping with product adoption, such as access to hardware, access to software, and access to online advertising services. This will allow EU courts and agencies to anticipate the likely impact of the merger on R&D programs and innovation cycles.

With respect to *assets*, EU courts and agencies should study whether the merger involves the acquisition of key innovations and knowledge transfer. If this is the case, EU courts and agencies should distinguish between the acquisition of an autonomous innovation (i.e., an innovation that can be commercialized without the need for complementary access/assets) and an architectural innovation (i.e., an innovation that requires complementary technologies).¹⁴⁸ If a company acquires an architectural innovation that the target could operate on its own, the authorities may wish to prohibit the merger in order to protect competition between different infrastructures.

In terms of *skills*, EU courts and agencies should want to analyze the track record and ability of the merged entities to complement each other, rather than simply focusing on “business stealing” (i.e., whether the merged parties will steal market share from each other). Typically, firms are geared toward

¹⁴⁷ Teece, *op. cit. supra*, note 7.

¹⁴⁸ Teece, “Economic Analysis and Strategic Management”, *California Management Review*, Vol. 26, No. 3 (1984), pp. 87.

efficiency or innovation.¹⁴⁹ If the acquirer and the target are tailored to increase efficiency, the merger is expected to create economies of scale. If they are geared towards innovation, the merger is expected to open up new markets.¹⁵⁰ For example, merger decisions such as T-210/01 General Electric (2005) and C-12/03 P Tetra Laval (2010) may have been motivated by the desire to acquire the target’s know-how. By focusing solely on “efficiencies,” a concept often associated with lower prices, EU courts and agencies discard other concepts such as robustness, dynamism,¹⁵¹ ordinary¹⁵² and super-ordinary capabilities.¹⁵³ Considering that EU courts and agencies should logically favor mergers that open new markets in IDMs, we recommend that they broaden their analysis to identify such mergers where are geared toward innovation.¹⁵⁴ We also recommend that, whenever relevant, practicing lawyers argue for post-merger gains in innovation, rather than focusing solely on efficiencies.

Overall, mergers in IDMs where the merging parties are the only ones with key access to infrastructure (such as access to computing power), assets (such as architectural innovation that the target could work on alone), and a focus on efficiency should be closely scrutinized. Many should be prohibited. Mergers in which the new entity could reduce incumbents’ access to one or two of these elements should be moderately scrutinised. Other mergers should

¹⁴⁹ The literature shows a distinction between organizations designed for efficiency and those designed for innovation, *see* Burns & Stalker, *The Management of Innovation* (Tavistock, 1961) (showing that firms are designed alternatively to increase efficiency or to innovate); Abernathy & Utterback, “Patterns of Industrial Innovation”, *Technology Review*, Vol. 80 (1978); Schumpeter, *The Theory of Economic Development* (Harvard University Press, 1934); Holland, *Adaptation in Natural and Artificial Systems* (University of Michigan Press, 1975); Kuran, “The Tenacious Past: Theories of Personal and Collective Conservatism”, *Journal of Economic Behavior and Organization*, Vol. 10 (1988), pp. 143-171; March, “Exploration and Exploitation in Organizational Learning,” *Organization Science*, Vol. 2, No. 1 (1991), pp. 71-87; Sarkees & Hulland, “Innovation and Efficiency: It Is Possible to Have It All”, *Business Horizons*, Vol. 52, No. 1 (2009), pp. 45-55 (“relatively few firms” are able to “simultaneously engages in a high degree of both innovation and efficiency”). Companies that prioritize efficiency tend to focus on cost-cutting measures and optimizing existing processes, while companies that prioritize innovation tend to focus on developing new products and services. The distinction between innovation and efficiency as two separate and exclusive survival strategies goes back to Darwin who showed that species must retain optionality in order to survive; Darwin, *On The Origin Of Species* (John Murray, 1859), pp. 127 (diversity in a species maximize its chances of adapting to changing environments).

¹⁵⁰ Efficiency and fundamental innovation are, generally speaking, not compatible objectives, *see* Burns and Stalker, *op. cit. supra* note 149.

¹⁵¹ Teece, Pisano and Shuen, “Dynamic Capabilities and Strategic Management”, *Strategic Management Journal*, Vol. 18, No. 7 (1997), pp. 516 (“the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments”).

¹⁵² Optimizing capabilities supporting efficiency.

¹⁵³ Learning capability to transfer across tasks and interests.

¹⁵⁴ Pisano & Teece, “How to Capture Value from Innovation: Shaping Intellectual Property and Industry Architecture”, *California Management Review*, Vol. 50, No. 1 (2007), pp. 278-296.

be deemed unproblematic. Adopting such a framework would align with, reinforce and clarify the current legality test applied by EU courts, in which they already examine how the merger may create barriers to innovation (where innovation is a necessity for survival), and incentives to innovate (where innovation is a driver of market dynamics). Note, importantly, that the proposed framework leaves little room for market structures as IDMs compete from outside the boundaries of each market. Market structures are poor predictors of competitive pressure when innovation is the main driver.

Second, EU courts and agencies should broaden their analysis of harm to innovation.¹⁵⁵ The absence of cases discussing harm to process innovation is puzzling.¹⁵⁶ This could indicate a lack of consideration for dynamic capabilities, i.e., “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.”¹⁵⁷ Dynamic capabilities play a crucial role in a dynamic environment where firms need to constantly adapt to complex ecosystems.¹⁵⁸ These capabilities are recognized in the literature as sources of competitive advantage. They should be of concern to EU courts and authorities.¹⁵⁹ Harm to innovation in business processes, whether by the incumbent or by competitors, should then feature prominently in enforcement actions and decisions.

Progress should also be made on the legality test for assessing harm to innovation. EU courts and agencies should consolidate the standard of proof they currently require, i.e., to demonstrate a “probable impact” on innovation. The requirement to quantify harm to innovation is too difficult to prove in the absence of a general theory of innovation provided by the literature.

¹⁵⁵ Supporting this claim, see Costa-Cabral, “Innovation in EU Competition Law: The Resource-Based View and Disruption”, *Yearbook of European Law*, Vol. 37 (2018), pp. 305–343; Sag & Waller, “Promoting Innovation” 100 *Iowa Law Review* 2223 (2015), pp. 2223-2247. Rejecting this claim, see Ibáñez Colomo, “Restrictions on Innovation in EU Competition Law”, *European Law Review*, Vol. 41, No. 2 (2016), pp. 201-219.

¹⁵⁶ We recommend that courts that allow these theories of harm, but also, that practicing lawyers dare to bring them in court.

¹⁵⁷ Teece, Pisano and Shuen, “Dynamic Capabilities and Strategic Management”, *Strategic Management Journal*, Vol. 18, No. 7 (1997), pp. 516.

¹⁵⁸ Petit and Teece, op. cit. *supra* note 2.

¹⁵⁹ Li and Liu, “Dynamic Capabilities, Environmental Dynamism, and Competitive Advantage: Evidence from China”, *Journal of Business Research*, Vol. 67, No. 1, (2014), pp. 2793-2799; López, “Competitive Advantage and Strategy Formulation: The Key Role of Dynamic Capabilities”, *Management Decision*, Vol. 43 No. 5, (2005), pp. 661-669; Reuter, Foerstl, Hartmann, and Blome, “Sustainable Global Supplier Management: The Role of Dynamic Capabilities in Achieving Competitive Advantage”, *Journal of Supply Chain Management*, Vol. 46, No. 2 (2010), pp. 45-63; Schilke, “On the Contingent Value of Dynamic Capabilities for Competitive Advantage: The Nonlinear Moderating Effect of Environmental Dynamism”, *Strategic Management Journal*, Vol. 35, No. 2 (2013), pp. 179-203.

Nevertheless, if the burden of proof in IDMs is met (i.e., if likely harm to innovation is demonstrated), EU courts and authorities should consider the practice as the most serious offense there is.¹⁶⁰ This means that only a highly positive impact of the practice on prices and other variables should outweigh the (likely) harm to innovation. To date, eight cases implicitly rely on the “impact effect.” They do not give it significant weight, nor do they draw all the conclusions from it as they do not consider harm to innovation to be the central theory of harm.

Third, EU courts and agencies should systematize innovation improvements as a valid justification for IDMs.¹⁶¹ Digital technologies and innovation in the tech and pharmaceutical industries allow for a granular analysis of relevant practices. EU courts and agencies can analyze whether the anti-competitive practice at the level of the code – or of the drug composition – is necessary to promote innovation. If the harm to competition and the benefit to innovation are unrelated, EU courts and agencies should reject the justification. In all other cases, EU courts and agencies should adopt an ‘innovation first’¹⁶² principle, whereby they do not attempt to compare the impact of the practice on competition with the impact on innovation, but systematically favor innovation (i.e., justify the practice).¹⁶³ In this way, EU courts and agencies will favor business uncertainty for these IDMs and thus create more competition than if they punished the anti-competitive practices that also favor innovation. With regard to the burden of proof for establishing innovation benefits, we recommend that EU courts and agencies consolidate their approach by enshrining the principle according to which a “sufficient degree of probability” that the practice benefits innovation meets the required threshold.

¹⁶⁰ Hovenkamp, “Antitrust and Innovation: Where We Are and Where We Should Be Going”, *Faculty Scholarship at Penn Law*, (2011), pp. 751 (“as innovation promises greater growth than market movements toward competition, so too can restraints on innovation do more harm”).

¹⁶¹ Recall once again that “innovation as a defence” is different from “efficiency as a defence” as firms typically have to choose between innovation and efficiency, *see supra* 149.

¹⁶² Bloom, Schankerman and Van Reenen, “Identifying Technology Spillovers and Product Market Rivalry”, *Econometrica*, Vol. 81, No. 4 (2013), pp. 1347-1393 (innovation social returns ranges from 55% to 74%). *See also*, Griffith, Redding and Van Reenen, “Mapping the Two Faces of R&D: Productivity Growth in a Panel of OECD Industries”, *The Review of Economics and Statistics*, Vol. 86, No. 4 (2004), pp. 883–895 (innovation return in other industries ranges from 57% to 105%).

¹⁶³ Contrary to Tim Wu’s suggestion, innovation and exclusion are not necessarily “alternative responses to an external challenge,” *see* Wu, “Taking Innovation Seriously: Antitrust Enforcement if Innovation Mattered Most”, *Antitrust Law Journal*, 78 (2012). Innovation may lead exclusion, *see* Schrepel, “Predatory Innovation: The Definite Need for Legal Recognition”, *SMU Science and Technology Law Review*, Vol. 21, (2017), pp. 21-72 and Schrepel, “The ‘Enhanced No Economic Sense Test’: Experimenting With Predatory Innovation”, *NYU Journal of Intellectual Property & Entertainment Law*, Vol. 7 (2018), pp. 30-72.

5. Next steps

Our study is the first to undertake a systematic content analysis of innovation in competition law. It provides competition experts with a comprehensive dataset and complete description of the case law. On this basis, and building on the literature, we formulate 10 proposals to make EU courts and agencies’ approach to innovation more coherent and exhaustive. If implemented, we believe that competition law would be better positioned to support dynamic competition.

This article calls for several next steps. *First*, the analysis should be extended to other countries and jurisdictions, such as the United States,¹⁶⁴ national competition agencies in the EU, etc. *Second*, one should monitor the literature on innovation to document what criteria could be added to our systematic content analysis. In the absence of a general theory of innovation, researchers build their understanding of innovation brick by brick. New building blocks should be reflected in future studies of case law. *Third*, and finally, one should experiment with other techniques to (at least partially) automate systematic content analysis, whether to assist with coding, detect new patterns, correlations, etc. Recent advances in natural language processing open new possibilities that will ultimately benefit competition experts.¹⁶⁵

¹⁶⁴ Griffith, Redding and Van Reenen, op. cit. *supra* note 162.

¹⁶⁵ See Stanford Computational Antitrust, <<https://law.stanford.edu/codex-the-stanford-center-for-legal-informatics/computational-antitrust-publications/>>, (last visited 8 Apr. 2023).