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Disruptive Innovation and Antitrust

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DISRUPTIVE INNOVATION AND ANTITRUST

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INTRODUCTION

Ever since the decisions of US and EU antitrust authorities in Microsoft at the turn of this century, there is some unease as to the effectiveness of competition or antitrust law enforcement when and where innovation is part of the competitive landscape. In Microsoft, US enforcement efforts concentrated on the anti-competitive practices of the biggest tech company of the time surrounding its integration of Internet Explorer into the Windows operating system.¹ On the other side of the Atlantic, the EU enforcement touched upon two practices, namely: (i) a refusal to release interoperability information concerning the Windows 2000 server operating system; and (ii) the integration of Windows Media Player into the Windows operating system.² Both US and EU cases led to the imposition of a series of obligations on Microsoft. In the US, Microsoft consented to a number of behavioral remedies, the most significant of which was perhaps to give customers the ability to choose their default program (for the browser, but also for the e-mail client, the media player, etc.).³ In the EU, Microsoft was compelled to release interoperability information to competing server operating systems manufacturers (such as Sun and Novell) and to release a version of the Windows operating system without a media player bundled with it.

There has been much commentary about the litigation on both sides of the Atlantic,⁴ and it is not the purpose of this paper to add to it. Rather, with

¹ For the US case, relating to the ‘browser wars’: US v. Microsoft 84 F. Supp.2d 9 (D.D.C. 1999, findings of fact), 87 F. Supp.2d 30 (D.D.C. 2000, conclusions of law), 97 F. Supp.2d 59 (D.D.C. 2000, remedial order), reversed and remanded on appeal 253 F.3d 34 (D.C. Cir. 2001). Upon remand, a consent decree was entered with the US and many States, which the court approved; as of the other States that were not party to the consent decree, the case was settled along the lines of the decree: 231 F. Supp.2d 144 (D.D.C. 2002), affirmed 373 F.3d 1199 (D.C. Cir. 2004).

² For the EU case, relating to access to interoperability information for Windows Server OS and the tying of Windows OS and Windows Media Player: Case COMP/37.792 Microsoft [2007] OJ L 32/23, confirmed by the GC in T-201/04 Microsoft v. European Commission ECLI:EU:T:2007:289. Subsequently, the Commission imposed penalty payments on Microsoft for failing to comply with the 2004 Decision: Case COMP/37.792 Microsoft [2009] OJ C 166/20, confirmed by the GC, T-167/08 Microsoft v. European Commission ECLI:EU:T:2012:323. In a later case, the Commission accepted commitments regarding the integration of Internet Explorer into Windows OS: Case COMP/39.530 Microsoft [2010] OJ C 36/7, followed by a fine for failure to comply, Case COMP/39.530 Microsoft [2013] OJ C 120/15.

³ At the time, this was effected through a modification to the Windows operating system as part of a service package (SP1).

⁴ Two books, WILLIAM H. PAGE AND JOHN E. LOPATKA, *THE MICROSOFT CASE: ANTITRUST, HIGH TECHNOLOGY AND CONSUMER WELFARE* (2009) and ANDREW I.

the benefit of hindsight, we want to point out that the remedies did not produce the expected effect.⁵ The US remedies did not prevent Microsoft Internet Explorer from enjoying a run of multi-year dominance, although they might have accelerated its eventual demise. The introduction of Firefox resulted in some market share loss, but it is the introduction of Google Chrome in 2008 that spelled the demise of Explorer.⁶ The EU remedies fared even worse, since none of the firms ostensibly benefiting from the Commission decision – Sun and Novell for server operating systems, RealPlayer for media players – managed to remain competitive on their respective markets, nor did other firms take advantage of the possibilities opened by the decision to achieve market success.⁷ In the midst of all of this, Microsoft managed to retain its super-dominance on client operating systems, which was at the root of all the theories of harm put forward on both sides of the Atlantic. Nevertheless, no one would argue that Microsoft today presents the competitive threat that it once did. With the development of browser-centric computing, ushered in by Google and others in the 2000s, the PC operating system went from the core to the margins; it became a product that no longer so clearly affected technical performance, consumer satisfaction and ultimately market outcomes. Later on, the rise of mobile devices not running PC operating systems further strengthened that trend.

Arguably, a similar pattern can be observed in the *Google* cases. The types of Google practices targeted by antitrust enforcers include: (i) self-preferencing via-à-vis “vertical search providers” in the management of so-called “organic” results of its search engine;⁸ (ii) contractual clauses (tying,

GAVIL AND HARRY FIRST, *THE MICROSOFT ANTITRUST CASES COMPETITION POLICY IN THE TWENTY-FIRST CENTURY* (2014) offer, when combined, a good overview of the spectrum of opinions. The EU case is discussed in greater detail in two companion pieces in the *Antitrust Law Journal*, Christian Ahlborn & David S. Evans, *The Microsoft Judgment and Its Implications for Competition Policy Towards Dominant Firms in Europe*, 75 ANTITRUST L.J. 887 (2008), and Pierre Larouche, *The European Microsoft Case at the Crossroads of Competition Policy and Innovation*, 75 ANTITRUST L.J. 933 (2008).

⁵ They did have an effect, but it was more indirect, as discussed in Part III.

⁶ See the data available from StatCounter, www.statcounter.com.

⁷ Daniel Gore and Ashwin van Rooijen, *Ex Post Assessment of European Competition Policy: The Microsoft Cases*, in ASSIMAKIS KOMNINOS AND NICOLAS PETIT (EDS) *EX POST EVALUATION OF COMPETITION CASES* (2021), 17–44.

⁸ The subject-matter of the first EU case against Google: Case AT.39740 Google Search (Shopping) [2018] OJ C 9/11, upheld by the GC, Case T-612/17, *Google v. Commission*, ECLI:EU:T:2021:763, now before the CJEU, Case C-48/22 P. It should be noted that the original EU investigation encompassed a much broader set of vertical search providers, but that the final decision concerned only the relationship between Google Shopping and rival comparison shopping providers: see

non-fragmentation) in its agreements with smartphone manufacturers and mobile operators to favor its search engine and advertising businesses;⁹ and (iii) contractual clauses forcing publishers to favor its advertising business.¹⁰ Since the US cases have either been abandoned or are still pending, this list is limited to existing EU precedents.

In Google Search (Shopping), the Commission was concerned about Google tweaking the display of search results so as to put its own specialized (vertical) services, such as “Google Shopping”, ahead of competing specialized services. It sought remedies that would preserve the competitive position of rival comparison-shopping services, although the effectiveness of these remedies in practice has been questioned.¹¹ At the same time, it is clear that Google has not managed to make much market headway with Google Shopping, since comparison shopping services were effectively overshadowed by the rise of Amazon’s online marketplace. Notwithstanding this commercial dynamic, the Commission in Google Search (Shopping) was at pains to define relevant markets so narrowly as to leave Amazon almost entirely outside the scope of its competitive analysis.¹² The pattern continued in Google Android, where the Commission was ostensibly trying to protect rival search engines from the effects of Google’s tying practices. The remedies – a change in licensing practices and the introduction of a browser

Communication pursuant to Article 27(4) of Reg. 1/2003, Google [2013] OJ C 120/22. The FTC also inquired into the same course of conduct, but found no grounds for action, concluding that these practices were rather pro-competitive: see FTC Statement, In the Matter of Google Inc., File No. 111-0163 (January 3, 2013), available at www.ftc.gov.

⁹ The subject-matter of the second EU case against Google: Case AT.40099 Google Android [2019] OJ C 402/19, upheld by the GC, Case T-604/18, Google v. Commission, ECLI:EU:T:2022:541, now before the CJEU, Case C-738/22 P. Similar conduct is also impugned in *US v. Google* and *Colorado v. Google*, Cases 20-cv-3010 and 20-cv-3715, parts of which survived the summary judgment stage (D.D.C., 4 August 2023) and are now being tried. In addition, these US cases also target Google’s agreement with Apple for Google’s search engine to be the default setting on Apple’s Safari browser.

¹⁰ The subject-matter of the third EU case against Google: Case AT.40411 Google Search (AdSense) [2020] OJ C 369/6, now before the GC, Case T-334/19. There is a fourth ongoing EU case which also relates to the adtech value chain: Case AT.40670 where the Commission is contemplating a structural separation. In the US, Google faces three antitrust claims relating to other practices in its advertising business: *US v. Google*, Case 1:23-cv-108 (D.D.C.), *Texas v. Google*, Case 4:20-cv-957 (E.D. Tex.) and a consolidation of private claims: *In re: Google Digital Advertising Antitrust Litigation*, Case 1:21-cv-6841 (S.D. N.Y.), all of which are now pending.

¹¹ See Philip Marsden, *Google Shopping for the Empress’s New Clothes*, 11 J. EUR. COMP. L. & PRAC (2020) at 553–60.

¹² See in particular Google Shopping, *supra* note 8 at ¶ 216.

choice screen when setting up Android¹³ – have also been criticized as being ineffective. Here as well, however, Google’s market gains seem to have been kept in check, at least as far as mobile operating systems are concerned, by the rise of the app-based Internet, heralded by Apple.¹⁴ More generally, while Google remains a quasi-monopolist on search engines, its resulting market power is mitigated by the loss of centrality of the search engine within the broader ecosystem in which it operates, following the rise of parallel means of access to information, including social networks in earlier years, and now generative AI.

The common thread running through these two cases is that the perceived competitive threat arising from dominance was effectively addressed not so much through the enforcement of antitrust law, but rather through the evolution of the technologies and markets, in the wake of innovation. This is not to say that the antitrust enforcers did not pay attention to innovation: quite to the contrary, in both *Microsoft* and *Google*, enforcement agencies were well aware that the impact of innovation should play a role in their analysis. In short, as will be further elaborated below, agencies intervened to try to protect what is known as ‘sustaining innovation’, while market forces produced what is referred to as ‘disruptive innovation’. That disruptive innovation was decisive for the competitive outcome.

Disruptive innovation is hence relevant for antitrust policy, yet it has received scant attention in the literature and in the decision practice. Building on previous work,¹⁵ this paper seeks to provide an expanded analysis of how disruptive innovation can be integrated more systematically into antitrust law and policy. We believe that disruptive innovation poses the greatest challenge to antitrust analysis, since it is that type of innovation that is most different from routine static market phenomena. As will be further explained below, disruptive innovation perfectly encapsulates and pushes to their outer bounds the elements that characterize innovation in general: unpredictability, uncertainty, dynamic effects and significant, sometimes brutal, impact. It is perhaps also the most sophisticated innovation theory found in the literature,

¹³ See the explanations given by Google: <https://blog.google/around-the-globe/google-europe/complying-ecs-android-decision/> (October 16, 2018) and <https://www.android.com/choicescreen/> (June 12, 2023).

¹⁴ It will be recalled that the advent of contemporary mobile computing, especially with the launch of the iPhone in 2007, created a threat to Google’s dominance on search (on computers). Google felt compelled to enter the mobile arena, building on its purchase of Android in 2005.

¹⁵ Pierre Larouche and Alexandre de Stree, *Disruptive Innovation and Competition Policy Enforcement*, OECD/DAF/COMP/GF(2015)7 (2015); Pierre Larouche, *Platforms, Disruptive Innovation and Competition on the Market* COMPETITION POLICY INTERNATIONAL (2020).

since it brings together technology, economics, business and sociology and it is built on a paradox, as will be seen below. Hence, if disruptive innovation can be factored in antitrust analysis, then antitrust analysis overall will have made significant progress in dealing with dynamic effects and innovation in general.

As a starting point, Part 1 reviews how business literature defines disruptive innovation and its implications for business strategy. Part 2 then examines how, in general, disruptive innovation could fit within antitrust analysis, as competition *on* the market as opposed to competition for the market. Part 3 examines the implications of disruptive innovation for antitrust metrics and theories of harm. Finally, Part 4 brings together our conclusions from the foregoing review.

I. DISRUPTIVE INNOVATION AND BUSINESS STRATEGY

Nowadays it is very fashionable to talk of ‘disruptive innovation’. As with every buzzword, however, increasing frequency of use adversely affects conceptual sharpness. Accordingly, it is useful to start by going back to the history of the term in the business literature. Disruptive innovation is closely associated with the work of Christensen,¹⁶ which has achieved tremendous success within management theory and practice in the past 25 years. Along the way, of course, it has been subject to some criticism¹⁷ as well as refined¹⁸ and expanded by Gans.¹⁹ The starting point for the literature on disruption is the paradoxical observation made by Christensen that successful firms which by all accounts are well run will often fail nonetheless, as a consequence of an innovation sweeping them away.²⁰ Christensen called this process ‘disruption’ and hypothesized that firms fail precisely because they are well run. Gans summed it up by defining disruption as ‘what a firm faces when the choices that once drove a firm’s success now become those that destroy its future’.²¹ Under these circumstances, the incumbent firm(s) will be displaced by one or more entrant(s) riding on the coattails of disruptive innovation.

A. TYPES OF DISRUPTIVE INNOVATION

Disruptive innovation can upturn either the demand or the supply side of the market. Originally, Christensen focused on demand-side disruption, but a

¹⁶ CLAYTON M. CHRISTENSEN, *THE INNOVATOR’S DILEMMA* (1997).

¹⁷ R. Henderson, *The Innovator’s Dilemma as a Problem of Organizational Competence* 23 J PROD. INNOV. MGMT 5 (2006).

¹⁸ R. Adner, *When Are Technologies Disruptive? A Demand-Based View of the Emergence of Competition* 23 STRAT. MGMT. J. 667 (2002).

¹⁹ JOSHUA S GANS, *THE DISRUPTION DILEMMA* (2016).

²⁰ Christensen, *supra*, note 16.

²¹ Gans, *supra*, note 19, at 13.

more complete account of disruptive innovation dictates that a supply-side variant of disruptive innovation should also be taken into account.

1. *Demand-Side or Consumer Disruption*

Demand-side disruption involves a change in the ‘value network’. The value network is understood as “*the context within which a firm identifies and responds to customers’ needs, solves problems, procures input, reacts to competitors, and strives for profit*”.²² It is therefore far more than just a technological state or some other parameter of progress; rather, it is the entire commercial, economic, technological, sociological and cultural surroundings within which firms and customers evolve.²³

As Christensen describes it, a typical well-run incumbent will seek to innovate, in order to maintain or improve its competitive position. That innovation will take place within the value network, however, and hence it is referred to as ‘*sustaining innovation*’. Sustaining innovation tends to pull the market upwards towards the high-end: products will be made to perform better, to offer new features and options, etc. For instance, the birth hour of the ‘value network’ surrounding home video was the introduction of the VCR in the 1970s, with its tape system allowing households to record and read video content. The VCR was replaced by the DVD in the 1990s, and later by Blu-ray: these are the main events in a long and rich string of sustaining innovations, whereby domestic video recording and viewing devices have become more and more sophisticated along a range of parameters, including video and sound quality, ease of use and convenience, recording possibilities and viewing options.

The high-end drift that comes with sustaining innovation, Christensen explains, occurs because firms are closely listening to – or even anticipating – the wishes of their existing customers. In so doing, they might leave a door open at the lower end of the market for an entrant from outside the value network. That entrant jumps into the fray, with a novel product that meets the most basic requirements of the value network and is therefore perceived as a low-end offering. Yet this product offers additional worth, outside of the value network, which proves attractive to some customers. These customers

²² Christensen, *supra* note 16, at 558. As he indicates, Christensen is indebted to Giovanni Dosi’s ‘technological paradigm’ concept: *Technological Paradigms and Technological Trajectories* 11 RESEARCH POLICY 147–62 (1982). However, Christensen is less deterministic than neo-Schumpeterians such as Dosi, in that he does situate value networks within a broader historical perspective.

²³ For the antitrust law specialist, the question that readily comes to mind is how the ‘value network’ relates to the bedrock of antitrust analysis, the relevant market. That issue is discussed *infra* Part III.A.

are typically those who are ‘underserved’ and neglected within the value network, or not served at all. If the entrant manages to gain a foothold on the low-end of the market, it can progressively move upmarket.²⁴ As the value network is now re-defined on the entrant’s terms, more and more customers come around to the recast value network. Eventually, the entrant can supplant incumbent firms. This is why, as Christensen explains, even successful firms that invest in innovation within their value network (sustaining innovation) and stay nimble can nevertheless be displaced by such *disruptive innovation*. Disruptive innovation comes from the veritable ‘blind side’ of incumbent firms.

Staying with the video recording example used above, this century witnessed the start of another technology, streaming, which at first was not really a competitor to DVDs and Blu-ray. Streaming was low-resolution and unreliable at first, but the technology improved, and so did the underlying networks. Beginning as a niche offering, streaming progressively reached the point where – with the help of YouTube and others – it could satisfy the basic needs of the low end of the market, while offering additional elements of value (no need for physical media, ubiquity, etc.). Firms active on the DVD and Blu-ray markets, despite the quality of their products, were unable to stop streaming from eating up their market. As it continued to improve toward the higher-end, streaming became a suitable substitute for a wide range of consumers. The value network has now shifted so that the values of streaming are now central, and physical media systems (DVD, Blu-ray) have become more of a niche market. The introduction of video streaming can therefore be considered to be ‘disruptive’ innovation.²⁵

²⁴ This is not to be confused with the ability of smaller firms to overcome barriers to expansion in a market by increasing the sophistication of their service offerings over time, having initially entered the market with a simple commoditized offering which was competitive solely in terms of price. In the case of a Mobile Virtual Network Operator (MVNO), for example, access to spectrum and infrastructure provides them with the possibility to invest in the deployment of a network which will allow them to compete head-on with Mobile Network Operators (MNOs). This migration does not mean, however, that the result is a fundamental change in the value network, as the aspiration of the MVNO is rather to compete head-to-head with the MNO.

²⁵ Combining both distinctions, a sustaining innovation may be incremental or breakthrough while a disruptive innovation is often harder to characterize, given the lack of continuity between the disruptive innovation and the technological state of the art within the established value network. In that sense, the introduction of streaming might seem like an incremental innovation when compared to the technological state of the art regarding the transmission of content on the Internet, yet it disrupted the traditional value network associated with home video products.

2. *Supply-Side or Architecture Disruption*

The theory of demand-side disruption, via low-end market entry that eventually changes the value network and displaces the incumbent, does not suffice to explain all cases where incumbents fail despite good management. It cannot account, for instance, for the effect that the iPhone had on mobile communications devices. The introduction of the iPhone contributed to the demise of, among others, RIM (BlackBerry), even though RIM had been well run. The iPhone generated a disruptive effect, yet its introduction cannot be classified as a low-end entry strategy that caters to neglected customers or new customers.

As Gans suggests, there is another type of disruptive innovation, involving not so much a shift in the value network on the demand side, but rather a change in architecture on the supply side.²⁶ Many products are made up of components that are tied together in an architecture: this is true not just of digital products based on layered or modular architectures,²⁷ but also of more traditional products, such as cars or machine tools. Producing firms possess knowledge and capabilities as regards both the components and their architecture. However, in most industries, following a period of experimentation, the architecture tends to coalesce around an industry-wide dominant design, which may arise as a result of legal or *de facto* standardization. This dominant design is then embedded by firms in their practices and procedures (routines).²⁸ From that moment on, the stock of architectural knowledge remains stable and it recedes into routines; firms focus their inventive efforts on component innovation. To some extent, the dominant design is baked into the internal organization of the firm. A well-managed firm will succeed in this environment until an entrant introduces an architectural innovation which upsets the dominant design. The incumbent may very well not perceive the architectural disruption immediately, and once the incumbent sees that the architecture is changing, it has to embark on a process of rediscovery and update of embedded architectural knowledge, followed by the development of new routines centered on the new dominant

²⁶ Gans *supra* note 19. Although it can be argued that the iPhone also led to a shift in the value network, to incorporate mobile Internet and a platform for third-party applications. Such architecture disruption had already been identified by Rebecca M. Henderson and Kim B. Clark, *Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms*, 35 ADMINISTRATIVE SCIENCE QUARTERLY 9 (1990).

²⁷ See Christopher S. Yoo, *Modularity Theory and Internet Regulation* U Ill L Rev 1 (2016).

²⁸ See RICHARD N. NELSON AND SIDNEY D. WINTER, AN EVOLUTIONARY THEORY OF ECONOMIC *Change* (1982) and BART NOOTEBOOM, LEARNING AND INNOVATION IN ORGANIZATIONS AND ECONOMIES (2000) for leading theories on organizational routines and firms as repositories of knowledge.

design. In so doing, the incumbent is at a disadvantage *vis-à-vis* the entrant, which does not bear the burden of outdated architectural knowledge buried in routines.

While the iPhone cannot qualify as consumer disruption, it did give rise to architecture disruption.²⁹ The iPhone heralded a change in mobile device architecture, with a series of features that have now become the dominant design. On the outside, these include the brick format, the full-length touchscreen with a minimum number of keys or buttons and, the user interface. On the inside, they include the first successful design for browsing on a mobile device (with scaling, etc.), a software platform for third-party application developers, with the requisite distribution and marketing support (AppStore). While none of these features would be considered groundbreaking on an individual basis, their combination in the iPhone produced a new architecture which was of such significance that it even led to a change in the very way we refer to these devices - from mobile phone to ‘smartphones’. This new architecture proved appealing to customers and struck a chord even with rival manufacturers. While it was possible for new rivals such as Samsung or Google to quickly turn around and adjust to the new design, established manufacturers, such as RIM or Nokia, could not. Their architectural knowledge was too ossified in existing routines for them to be able to adapt. Their organizations had settled on innovating on components within the hereto dominant design. Indeed, for a while after the iPhone’s introduction, RIM continued to do successfully what it did best, namely to improve the Blackberry. Once the iPhone became the dominant design, however, RIM was lost.

3. *Relationship with Breakthrough and Incremental Innovation*

At this juncture, it is important to dispel the frequent confusion that exists between the category pairs of sustaining/disruptive innovation, on the one hand, and incremental/breakthrough innovation, on the other.³⁰

Whether an innovation is ‘incremental’ or constitutes a ‘breakthrough’ refers to *technological*³¹ *progress* and qualifies the innovation with respect to the prior state of the art. An *incremental innovation* marks a small step forward (typically the improvement of a feature or characteristic of a technological paradigm), whereas a *breakthrough innovation* involves a

²⁹ See the account in Gans, *supra* note 19, at 40 and ff.

³⁰ Sometimes ‘marginal’ and ‘radical’ are used in the literature instead of ‘incremental’ and ‘breakthrough’, respectively.

³¹ An innovation can also arise from an invention relating to marketing or organization, for instance OECD, OSLO MANUAL: GUIDELINES FOR COLLECTING, REPORTING AND USING DATA ON INNOVATION, 4TH ED. (2018).

significant jump that is akin to a change of technological paradigm. For instance, to go back to the example cited above, adding slow motion or stop image capacities to a VCR is an incremental innovation; replacing VCRs with DVDs is a breakthrough innovation. The distinction between breakthrough and incremental innovations is now well established in the innovation literature.³² For one, it is generally acknowledged that the pharmaceutical sector – at least in its traditional form that is known under the ‘Big Pharma’ moniker – tends to be characterized by breakthrough innovation, whereas incremental innovation is much more prevalent in the digital sector.

In contrast, whether an innovation is ‘sustaining’ or ‘disruptive’ depends not on the amount of technological progress achieved with respect to the state of the art at the time, but on the relationship between the innovation and the environment around it, be it the *value network* on the demand side or the *architecture* on the supply side: a *sustaining innovation* takes place within the existing value network or architecture, whereas a *disruptive innovation* comes outside the existing value network or architecture, eventually reshaping them or and displacing them altogether. Disruption arises because the innovation takes hold and the incumbent is displaced in spite of its good management. To some extent, the category pairs are orthogonal, and the incremental/breakthrough pair is actually not that material for the analysis of disruptive innovations, as is illustrated in Table 1 below.

TABLE 1: TYPES OF INNOVATION

Technological progress	Value network or architecture	Sustaining innovation	Disruptive innovation
Incremental innovation		Features on home video devices	Video streaming
Breakthrough innovation		From VCR to DVD/Blu-ray	

4. *Disruptive Innovation and the Digital Economy*

Disruptive innovation is not a new phenomenon: the advent of the automobile (replacing horse-drawn carriages), of the telegraph (replacing mail) and of the phonograph (replacing live performances) can all be presented as disruptive innovations. However, in the past 50 years, we have

³² SUZANNE S. SCOTCHMER, INNOVATION AND INCENTIVES (2004).

witnessed an acceleration in the number and the frequency of industry disruptions. Indeed, disruptive innovations now often relate to the digital economy, where the disruptive effect can be accelerated through the reduction of production and distribution costs due to digitization as well as the elimination of intermediaries through network effects and scalability, which provide rapid access to a potentially global customer base.

This is why the theories of Christensen and others were developed against that more contemporary backdrop where entry is less costly than in earlier times. It is easier and quicker to disrupt a market today than it was in the past. Recent examples of disruptive innovation would include – in addition to the Christensen case-study on miniature hard drives – streaming (disrupting the DVD/Blu-ray industry), browser-centric computing (leading to cloud computing, disrupting the PC industry), smartphones and tablets (disrupting the PC and microprocessor industries), digital content and online distribution (disrupting the traditional content industries) or, arguably, the ‘sharing economy’ (disrupting traditional service industries like taxis and hotels). The future disruption will be due to the development of Artificial intelligence, in particular generative AI.

In particular, there is ample evidence that in the platform economy, large firms are vying to disrupt one another, adding to the threat of disruption coming from smaller entrants. Firms compete to displace one another from a central position in the broader ecosystem. Microsoft was sidelined by then-upstart Google, which shifted the center of attention from the operating system to the search engine and the Internet. Google itself is under threat not so much from its head-to-head competitor, Microsoft’s Bing search engine, but rather by sideways competition from Meta, Amazon or, more recently, from ChatGPT. Meta is attempting to make the social network the main source of online experience, thereby leaving the search engine to address the long tail of unusual queries. With iOS, Apple also created a platform for the user experience to flow via apps over which Google has little control, as opposed to the Google search engine. Similarly, generative AI such as ChatGPT could take over as the go-to system for interaction with online information. In connection to these challenges, Google launched Google+ (without success), Android (with massive success) and Gemini (with uncertain success). Meta itself was in danger of becoming irrelevant when users shifted from desktops to mobile devices, but it managed to navigate that transition successfully. Apple might be the most vulnerable of these firms, since it relies heavily on its ability to keep the iPhone at the leading edge of smartphones, and is liable to fall into a sustaining innovation trap. The

‘GAFAM’³³ cluster, as it is sometimes called, regroups these five large firms that are endowed with considerable resources and sophisticated management capabilities. These firms all hold a gatekeeper position at some location in broader digital ecosystems, but they are constantly trying to disrupt each other on newer markets, such as AI or Augmented and Virtual Reality³⁴

B. IMPLICATIONS FOR BUSINESS STRATEGY

In the wake of the work of Christensen and others, disruptive innovation is now better understood. Accordingly, where available, it has become a popular entry strategy for firms. For incumbents faced with the risk of disruptive innovation, a number of counter-strategies are also at hand.

1. *Entrant Strategies*

From a business perspective, disruptive innovation offers an alternative path to market entry and growth, in addition to the more traditional path of challenging the incumbent firm(s) head-on, via sustaining innovation or, more statically, via cheaper products or superior marketing. Because it avoids head-to-head competition, a disruptive innovation strategy can allow the disruptor to grow ‘under the radar’ of incumbent firms and, if successfully executed, can offer more growth potential. This is why it is so attractive, despite the attendant risks because customers may prove reluctant to shift away from the established value network or the dominant design.³⁵

In the current environment, where more and more industries are characterized by scale effects on the supply and demand side, and with the rise of multi-sided platforms and ecosystems that compound these scale effects, conventional entry strategies have lost some or most of their appeal. An entrant (whether a start-up or a firm already established on another market) can choose to compete on a platform, i.e., within the ecosystem created by a platform operator. For instance, an entrant can choose to develop applications for the most prevalent operating systems (Android, iOS/macOS, Windows) and hope to succeed within that environment. This is a valid strategy, but with its inherent limitations, given that the platform inevitably

³³ Google-Apple-Facebook-Amazon-Microsoft. The GAFAM moniker has taken hold, especially in Europe, and remains in use despite the corporate name changes at Google (Alphabet) and Facebook (Meta).

³⁴ NICOLAS PETIT, *BIG TECH AND THE DIGITAL ECONOMY: THE MOLIGOPOLY SCENARIO* (2020).

³⁵ For example, the maverick entry of Hutchison into national mobile markets across the EU, with on a novel proposition based on major content offerings rather than merely voice and data communications, did not succeed in breaking down entrenched oligopolies in any of the national markets in which it had entered.

imposes some limits on growth and business strategies and also some technical limitations.

Another possible strategy is to challenge established players head-on and beat them with a better product. In the current environment, this is difficult to achieve. For instance, despite billions being invested in Bing, Microsoft cannot dislodge Google from its leading position on search engines. Once network effects and the resulting accumulation of data in favor of the largest player are factored in, Google's advantage becomes almost insurmountable. Unless customers multi-home regularly,³⁶ a new search engine would have to be vastly superior in performance to Google, in order to overcome Google's advantage.³⁷

In comparison, a disruptive innovation strategy avoids this frontal competition with the established player(s). At the same time, the would-be disruptor faces a greater challenge in crafting and offering an innovative product that will at least appeal to the lower-end of the existing value network and offer sufficient added value to draw customers and eventually shift the value network. Alternatively, if the disruptor aims to displace the dominant design, the task is even more challenging since the disruption is meant to occur across the whole spectrum of customers: the entrant needs to put forward a new design that is sufficiently appealing for customers to move to it, despite the differences with the hereto dominant design. As its name indicates, disruptive innovation remains innovation: the disruptor must manage both to invent something new *and* to have this invention diffused among, and adopted by, customers. Even more than for sustaining innovation, both invention and diffusion/adoption are affected by a high level of uncertainty in a disruption strategy.

2. *Incumbent Counter-Strategies*

Precisely because disruptive innovation can dislodge incumbents even if they are well managed, it poses a peculiar challenge to management theory and practice. After all, the initial writings of Christensen sought to explain the demise of well-run incumbents, and the premises of his theory implied

³⁶ Despite Google's mantra that 'competition is just one click away', search engine users do not tend to use multiple search engines, given time constraints.

³⁷ Of course, once a sufficient critical mass of users moves to the new search engine, the 'tipping' effect may turn against the incumbent and in favor of the entrant. However, as will be seen below in the discussion of competition for the market, few examples exist.

that incumbents could not escape their fate. Nevertheless, further research sought to develop management advice for the incumbent.³⁸

a. Pro-Active Strategies

While as a general rule incumbent management should be pro-active, disruptive innovation tends to come from the blind side and cannot easily be identified early on.³⁹ As noted above, demand-side disruption comes from the low-end of the market and involves products that depart from the established value network, so that the initial customer reaction is highly uncertain. By the time it becomes clear that customers are responding to the disruptive innovation, it might be too late already for the incumbent to react. The best advice to detect demand-side disruption early is for the incumbent to create an autonomous division ('skunk works') that can experiment with customer preferences without being trampled by the 'efficiency machine' at the heart of the incumbent's operations.⁴⁰ This is the strategy deployed by Amazon when developing the Kindle and experimenting with e-books.⁴¹

Supply-side disruption is similarly very hard to predict, since the new architecture is likely to co-exist with the current dominant design for a while, without any certainty as to whether the dominant design will be supplanted. The best advice to uncover supply-side disruption early, however, is not to operate 'skunk works' on the side, but rather to seek to keep the 'efficiency machine', the core of the operations, sufficiently alert to retain the ability to adopt architectural innovation. As was pointed out by Gans,⁴² this implies that the incumbent accepts a loss in static efficiency (because it does not completely settle into a routine) for the sake of dealing with disruption. This is the polar opposite of the best advice for dealing with demand-side disruption, which puts the incumbent in a strategic bind.

By engaging in 'preemptive innovation', incumbents are unavoidably hampered by the well-known 'replacement effect' identified by Arrow, i.e.,

³⁸ CLAYTON M. CHRISTENSEN AND MICHAEL E. RAYNOR, *THE INNOVATOR'S SOLUTION* (2003).

³⁹ This is why incumbents should remain paranoid, as famously advised in ANDY GROVE, *ONLY THE PARANOID SURVIVE* (1999).

⁴⁰ See V. GOVINDARAJAN AND C. TRIMBLE, *THE OTHER SIDE OF INNOVATION: SOLVING THE EXECUTION CHALLENGE* (2010), echoing the work of Christensen *supra* note 16, Nelson and Winter *supra* note 28 and Nooteboom *supra* note 28.

⁴¹ BRAD STONE, *THE EVERYTHING STORE: JEFF BEZOS AND THE AGE OF AMAZON* (2014).

⁴² Gans, *supra* note 19, at 98.

the fear of cannibalizing their existing business.⁴³ This places them at a disadvantage compared to entrants that have nothing to lose. To continue with the Amazon example, Amazon stands out in the business literature for having dared to branch into e-books over the fears of many managers that such a development would cannibalize the bookselling business which was one of the main sources of revenue at that time.⁴⁴

b. Defensive strategies

If an outsider appears to be carrying out a disruptive strategy, the incumbent can also have recourse to three types of defensive strategy: block, copy or buy. Meta, as reported by the US Congress, has run the entire strategic gamut: “*Facebook’s internal documents indicate that once it identified a competitive threat, it attempted to buy or crush them by cloning their product features or foreclosing them from Facebook’s social graph*”.⁴⁵

The first defensive strategy is to make the task of the would-be disruptor more difficult, if not impossible, by raising its costs. Invention does not generate innovation unless and until it is widely diffused and adopted by customers and users. Yet customer reaction is inherently unpredictable. In the case of demand-side disruption, the question is whether low-end or neglected customers will embrace the new offering, and whether the other customers will follow so as to shift the value network. In the case of supply-side disruption, the question is whether the inventive architecture proposed by the entrant will be adopted by customers and become the new dominant design. Disruption requires a foothold in the territory of the incumbent, from which the disruptor can leverage its innovation with a view to shifting the value network or replacing the dominant design. If the entrant cannot gain any such foothold, disruption cannot take place.⁴⁶ For example, streaming could not have disrupted home video recorders without access to content, just as the iPhone could not have revolutionized smartphone architecture without

⁴³ Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in ROBERT NELSON, *THE RATE AND DIRECTION OF INVENTIVE ACTIVITIES: ECONOMIC AND SOCIAL FACTORS* (1962); Carl Shapiro, *Competition and Innovation: Did Arrow Hit the Bull’s Eye?* in NBER, *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: REVISITED*, 361 (2011).

⁴⁴ STONE, *supra* note 41.

⁴⁵ SUBCOMM. ON ANTITRUST, COM. AND ADMIN. LAW OF THE COMM. ON THE JUDICIARY, MAJORITY STAFF REPORT AND RECOMMENDATIONS, INVESTIGATION OF COMPETITION IN DIGITAL MARKETS 51 (2020) at 5. Also SHEERA FRENKEL, CECILIA KANG, *AN UGLY TRUTH: INSIDE FACEBOOK’S BATTLE FOR DOMINATION* (2021).

⁴⁶ Jean Tirole, *Regulating the disrupters*, PROJECT SYNDICATE (2019).

relying on industry standards that rendered it a *bona fide* cellular phone from the outset.

To execute a blocking strategy, the incumbent could seek to *lock in customers* to deny any foothold to the disruptor. The incumbent might also *secure control over – and refuse access to – complementary assets*, i.e., physical assets, intellectual property or even services (manufacturing, distribution, marketing) that are necessary for any entrant to try to bring an invention to the market and turn it into a disruptive innovation.⁴⁷ As was pointed out by Teece in a seminal article, in the context of weak legal and technical appropriability of invention (which is the usual situation), access to complementary assets is essential to the success of an inventor.⁴⁸ This holds true in particular for specialized assets, upon which the invention depends, as opposed to generic complementary assets that are presumably less scarce. Teece studied the conditions under which the inventor should secure the necessary access via contract or acquisition (integration). Turning his analysis around to assume the incumbent’s perspective, securing control over complementary assets appears the best strategy to ensure that the incumbent can influence the course of any disruption, either by denying access to the would-be disruptor, expropriating some of the disruptor’s rents under contract or integrating outright with the disruptor.

The second defensive strategy consists in *copying the innovation of the potential disruptor*.⁴⁹ This course of action is similar to the pro-active strategies mentioned above, although this time as a defensive reaction against a potential threat. Here again, incumbents will be hobbled by the fear of cannibalizing their existing business and will have to balance the costs of self-disruption in terms of cannibalization against benefits in terms of preventing entry, with a high level of uncertainty as to both outcomes.

⁴⁷ Note that the opposite strategy could also work and consist in to maximize openness and information flows so as to ensure that the value network and the dominant design are firmly anchored amongst customers and suppliers: Joel West et al., *Open innovation: the next decade* 43 RESEARCH POLICY 805 (2014). In addition to open innovation, a strategic push for standardization – whether *de facto* or through standard development organizations – might also have the effect in practice of hampering disruption: aside from its benefits, standardization also makes the dominant design (and to some extent as well, the value network) even harder to displace, by enshrining it and attaching to it an official status.

⁴⁸ David J. Teece, *Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy* 15 RESEARCH POLICY 285 (1986).

⁴⁹ This is sometimes referred as “Sherlocking”, as a reference to the case of Apple copying the functionality of a search app called ‘Watson’, which was sold on its Mac platform. Apple updated its own app ‘Sherlock’ with very similar functionality.

The third defensive strategy is *to acquire the disruptive entrant*, thereby gaining control over the disruptive process and the transition from the established to the new value network or architecture. Such an acquisition can be carried out in the traditional way through the purchase of shares, but also indirectly through the purchase of assets (including IP) or the poaching of key personnel, or special partnership agreements. The timing of the acquisition will reflect a compromise between the need to identify the threat of disruption sufficiently clearly (in order to avoid superfluous acquisitions) and the need to act early, to avoid injury from disruption and to keep the acquisition price from skyrocketing. In practice, we observe that acquisition often take place early when the disruptor is still nascent.⁵⁰

These three strategies may reinforce each other, for example, as the threat of raising the costs of the disruptor or copying its innovation may ultimately reduce the acquisition cost.⁵¹ Again, the behaviour of Facebook, as reported by the US Congress, is illustrative of such a multi-pronged strategy. Referring to an exchange of messages between the CEOs of Facebook and Instagram, the Report notes that: “Mr. Zuckerberg suggested that refusing to enter into a partnership with Facebook, including an acquisition, would have consequences for Instagram, referencing the product Facebook was developing at the time: ‘*At some point soon, you’ll need to figure out how you actually want to work with us. This can be an acquisition, through a close relationship with Open Graph, through an arm’s length relationship using our traditional APIs, or perhaps not at all... Of course, at the same time we’re developing our own photos strategy, so how we engage now will determine how much we’re partners vs. competitors down the line—and I’d like to make sure we decide that thoughtfully as well.*’”⁵²

II. DISRUPTIVE INNOVATION AND TYPES OF COMPETITION

As was explained above, disruptive innovation usually generates the kind of ‘creative destruction’ described by Schumpeter,⁵³ thereby affecting firms on the market. If disruptive innovation is successful, the incumbent will suffer, but effects extend across the whole industry. For instance, when Apple introduced the iPhone – an architecture disruption – the mobile device industry was completely upended: Android device manufacturers followed into the breach, and within the space of a few years, there was a complete

⁵⁰ C. Scott Hemphill and Tim Wu, *Nascent Competitors*, 168 U. PENN. L. REV 1879 (2020) defining at 1883 nascent competitor as ‘a firm whose innovation represents a serious, albeit not completely certain, future threat to an incumbent.’

⁵¹ Massimo Motta and Sandro Shelegia, *The “Kill Zone”: Copying, Acquisition and Start-Ups’ Direction of Innovation*, CEPR DISCUSSION PAPER 16151 (2021).

⁵² Congress Report, *supra* note 45, at 165.

⁵³ JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY (1942).

changing of the guard. Out went the likes of RIM (Blackberry), Motorola and Nokia, while in came Apple, Samsung, HTC, Huawei, etc. The losses to the outgoing firms were massive but, by all accounts, it would be difficult to argue that society is not better off on balance. This combination of visible harm to competitors and yet a positive welfare effect makes disruptive innovation particularly interesting from the perspective of antitrust policy.⁵⁴ The backdrop to the last decades of antitrust scholarship has been the tension between harm to competitors, harm to competition as such and welfare effects.⁵⁵ While we do not aim to revisit this fundamental debate, we do want to illustrate how disruptive innovation might shed a different light on the terms of that debate.

A. COMPETITION *FOR* THE MARKET

In order to assess how disruptive innovation fits within antitrust law, it is necessary to go back to the literature on antitrust policy and innovation.⁵⁶ In the wake of the US *Microsoft* case twenty-five years ago, a debate arose as to whether antitrust law adequately took account of innovation, and more specifically whether the innovation incentives of firms were incorporated both in the competitive analysis and in the nature of the remedies imposed to address a competitive harm. The theoretical core of the Microsoft defense in that case, as explained by Evans and Schmalensee, rested upon the proposition that what was then dubbed the ‘new economy’ deserved a different treatment under antitrust law.⁵⁷ Those industries are characterized by “*a competitive process dominated by efforts to create intellectual property through R&D, which often results in rapid and disruptive technological change*”.⁵⁸ They feature high fixed costs and low marginal costs, a different mix of labor and capital, and network/platform effects.

As a result, constant innovation produces a series of ‘winner-take-all’ races. In these industries, it is said, firms do not compete *in* the market, but

⁵⁴ For this paper, we assume that the welfare implications of disruptive innovation are generally positive, as long as the innovation does not breach fundamental rights or adversely affect the pursuit of a public policy objective.

⁵⁵ For a crisp overview of the stakes and the remaining trans-Atlantic differences, see Eleanor M. Fox, *We Protect Competition, You Protect Competitors* 26 WORLD COMPETITION 149 (2003).

⁵⁶ For a recent account of the relationship between competition and innovation, see OECD, *COMPETITION AND INNOVATION: A THEORETICAL PERSPECTIVE* (2023).

⁵⁷ That case is set out and developed in greater detail in David S. Evans and Richard Schmalensee, *Some Economic Aspects of Antitrust Analysis in Dynamically Competitive Industries* 2 NBER INNOVATION POLICY & THE ECONOMY 1 (2002) at 3 and ff.

⁵⁸ *Id.*

rather *for* the market.⁵⁹ Unsurprisingly therefore, the leading firm occupies a large market position, but that does not mean that it necessarily holds monopoly power, since it is bound to be displaced by a more recent entrant sooner or later. It follows, according to this line of reasoning, that the application of antitrust law to these industries should be modulated according to these characteristics, which is usually taken to imply less intervention than under the more static ‘old-economy’ approach.⁶⁰ Gilbert⁶¹ summarizes well the subsequent literature which has generally taken sides in this debate, by either endorsing the approach of Evans and Schmalensee⁶² or by criticizing it and arguing that antitrust law should continue to be applied with few changes.⁶³

We would argue that the real underlying issue is not so much whether we need more or less antitrust intervention but rather whether antitrust law does not sufficiently incorporate dynamic effects (especially innovation) in its analysis. A number of authors have made this point.⁶⁴ In general, however, they have argued for the creation of new categories such as ‘new economy’, digital economy, etc., rather than articulate a more generally applicable approach to the problem. Indeed we would argue that hesitation to tackle that fundamental innovation issue has plagued the main analytical tool to emerge from this line of literature, namely, “competition *for* the market” as an alternative competitive model for digital industries. As an empirical matter, there are few genuine examples of competition for the market outside of the area of public procurement and utilities, where this model originated. Evans and Schmalensee rely on a series of examples in software applications, at the

⁵⁹ The distinction between competition *in* and *for* the market has an ancient lineage. Harold Demsetz, *Why Regulate Utilities* 11 J LAW ECON 55 (1968) at 57, traces it back to Edwin Chadwick, *Results of Different Principles of Legislation and Administration in Europe; of Competition for the Field, as compared with the Competition within the Field of Service* 22 J ROYAL STATISTICAL SOC 381 (1859). As these two references indicate, the distinction originated far from the new economy, in research on public procurement and utilities regulation.

⁶⁰ For a more recent and well-developed argument that antitrust law tends towards overenforcement in innovative industries, see G.A. Manne and J.D. Wright, *Innovation and the Limits of Antitrust* 6 J COMP L ECON 153 (2010).

⁶¹ RICHARD J. GILBERT, *INNOVATION MATTERS: COMPETITION POLICY FOR THE HIGH-TECHNOLOGY ECONOMY* (2020), Chapter 1.

⁶² For instance, R.A. Posner, *Antitrust in the New Economy* 68 ANTITRUST L.J. 925 (2001).

⁶³ See Michael L. Katz and Howard A. Shelanski, ‘Schumpeterian’ Competition and Antitrust Policy in High-Tech Markets, 14 COMPETITION at 47 (2005).

⁶⁴ Gilbert, *supra* note 61; Douglas H. Ginsburg and Joshua D. Wright, *Dynamic Analysis and the Limits of Antitrust Institutions*, 78 ANTITRUST L.J. 1 (2012); DAVID J. TEECE, *DYNAMIC CAPABILITIES AND STRATEGIC MANAGEMENT: ORGANIZING FOR INNOVATION AND GROWTH* (2009).

turn of the 80s. For word processing, WordPerfect (having itself ousted WordStar) was replaced by Microsoft Word. For spreadsheets, Microsoft Excel displaced Lotus 1-2-3. As for desktop publishing, QuarkXPress took the lead from Adobe PageMaker.⁶⁵ Later on, the ascent of the Google search engine in the early 2000s (on the ashes of AltaVista, which itself had replaced Lycos) or Facebook replacing MySpace, could also be seen as instances of competition *for* the market, resulting in incumbent replacement over time, rather than substitution between the competing offerings of competitors. However, there are few other ‘real world’ examples that fit the model of competition *for* the market.⁶⁶

In particular, in the two cases where that model was central to the argument of the defendant firm, it simply did not fit the facts. Despite Microsoft’s claim that there was competition for the PC operating systems market, Windows had been enjoying a long period of dominance (5–10 years). That run could be extended to almost 20 years if one considers that Windows replaced Microsoft’s own MS-DOS: in a way, Microsoft was competing with itself for the market. Similarly, despite Google’s insistence that ‘*competition is just one click away*’, its market position had remained untouched ever since it took over from AltaVista around 2002 as the leading search engine. Even if the Google search engine faces competition, no competitor has been able to supplant Google in the last 20 years. The facts are therefore consistent with the proposition that neither PC operating systems nor search engines have witnessed any meaningful competition *for* the market. This largely explains why antitrust enforcers have been reluctant to rally behind the model.

In essence, competition for the market implies that a relevant market is condemned to remain under the grip of a dominant player with the hope that, from time to time, the incumbent will lose its position to an entrant that then becomes the new dominant firm. Market discipline is meted out at irregular intervals through the threat of entry and eventual displacement, without much of a role for the enforcement agency since the agency lacks the tools to police competition for the market. At best, the agency can only take action where the theory of harm consists of actions designed to erect entry barriers that would perpetuate the monopoly. A classic example lies in the artificial attempts of patent holders in the twilight of their patent terms to extend their monopoly rights based on the soon-to-expire patents through various anti-

⁶⁵ Evans and Schmalensee, *supra* note 57, at 10–12.

⁶⁶ One could argue that the pharmaceutical industry – at least what is usually brought under the moniker “Big Pharma” – fits within a model of competition for the market, in those areas where successive generations of medications are introduced to treat a given condition (see the case of painkillers, for instance).

competitive practices.⁶⁷ Unless there is a quick succession of dominant players (or at least frequent challenges to the incumbent), there is a real risk that steady ‘low-level’ competitive harm could occur and remain unchecked. Politically, this cannot be very appealing to an enforcement agency, since it would amount to accepting that a relevant market will continually be affected by the conduct of whichever firm is dominant at any given moment.

Similarly, in the current debates on antitrust and digital platforms, policymakers are not content with ‘competition for the market’ models that lean towards less intervention. On the contrary, most leading recent policy studies advocate a greater level of intervention, precisely because of the cumulation of elements such as network effects, data feedback loops or power of default that lead to a concentration of economic, innovation and informational power in a few digital platforms.⁶⁸ Here again, the innovation rationale may not have been sufficiently and rigorously considered. For instance, in the EU Digital Markets Act⁶⁹ which regulates Big Tech platforms to increase market contestability and fairness, the innovation objective is only implicit in the law, with an underdeveloped rationale.⁷⁰

B. COMPETITION *ON* THE MARKET

Conceptually, the competition *for* the market model fails because it does not take the inclusion of dynamic effects into antitrust analysis to its logical end. It remains stuck in a static framework, suffering from the ‘static

⁶⁷ See for instance CJEU, Case T-691/14, *Servier v. Commission* ECLI:EU:T:2018:922 at Rec. 1385 and ff.

⁶⁸ See for example; JACQUES CRÉMER, YVES ALEXANDRE DE MONTJOYE YA AND HEIKE SCHWEITZER, *COMPETITION POLICY FOR THE DIGITAL ERA* (2019); JASON FURMAN, DIANE COYLE, AMELIA FLETCHER, D. MCAULEY, PHILIP MARSDEN, *UNLOCKING DIGITAL COMPETITION* (2019); FIONA SCOTT MORTON, P. BOUVIER, ARIEL EZRACHI, BRUNO JULLIEN, A. KATZ, GENE KIMMELMAN, DOUG MELAMED, D.J. MORGENSTERN, *COMMITTEE FOR THE STUDY OF DIGITAL PLATFORMS, MARKET STRUCTURE AND ANTITRUST SUBCOMMITTEE* (2019).

⁶⁹ Regulation 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives 2019/1937 and 2020/1828 (Digital Markets Act), OJ [2022] L 265/1.

⁷⁰ Pierre Larouche and Alexandre de Stree, *The European Digital Markets Act: A Revolution Grounded on Traditions*, 12 *JOUR. OF EUR COMPETITION L & PRACTICE* (2021) at 548. For a sharp critique of the innovation analysis done by the European Commission in preparing of this new legislation: David J. Teece and Henry J. Kahwaty, *Is the Proposed Digital Markets Act the Cure for Europe’s Platform Ills? Evidence from the European Commission’s Impact Assessment*, BERKELEY RESEARCH GROUP INSTITUTE (2021).

competition bias's identified by Evans and Hylton⁷¹ and Teece.⁷² While it may be true that 'competition for the market' analysis introduces an element of dynamism, given the implicit succession of dominant players over time, that dynamism is infused into the essentially static conceptual framework of 'relevant markets', which are defined once and for all at the start of the analysis. In a model of competition *for* the market, the relevant market is an exogenous constant, just as it is in the more conventional model of competition *in* the market.

As argued already, the literature on disruptive innovation instructs us to treat market definition as an endogenous variable in a dynamic context.⁷³ When a disruptor succeeds in shifting the value network to its advantage or in replacing the dominant design, that is bound to translate into a change in relevant market definition for the purposes of antitrust law. When streaming takes over from DVDs and Blu-ray, the market for home video recording and viewing changes. When the iPhone enters the fray, a new smartphone market takes hold, emerging from the earlier market for mobile devices.⁷⁴

The above is bound to have consequences for antitrust analysis. The existing relevant product market definition might not be entirely upended, but the position of the relevant market with respect to neighboring markets is affected in such a way that the competitive assessment is bound to change. A suitable example can be found in the market for PC operating systems, as defined in the *Microsoft* cases on both sides of the Atlantic. As mentioned at the outset, if a case arose today, there is a fair chance that the market would still be defined in terms of PC operating systems, with Microsoft still holding a commanding position.⁷⁵ Yet, with the onset of web-oriented computing and

⁷¹ As noted by David S. Evans and Keith N. Hylton, *The Lawful Acquisition and Exercise of Monopoly Power and Its Implications for the Objectives of Antitrust* 4:2 COMPETITION POLICY INTERNATIONAL 203 (2008), orthodox economic analysis suffers from a 'tractability bias' in favour of mathematical models of static competition (given the complexity of dynamic models), which induces a 'static competition bias' in antitrust law.

⁷² David J. Teece, *Big Tech and Strategic Management: How management scholars can inform competition policy*, 37 ACADEMY OF MANAGEMENT PERSPECTIVE 1 (2023).

⁷³ *Idem*, at 15.

⁷⁴ Compare with cases of sustaining innovation, where a new technological generation (5G instead of 4G, 4K HDTV instead of HDTV) is merely added to the range of products falling within an existing relevant product market.

⁷⁵ Even if MacOS systems are included, Microsoft Windows still holds around 70% of the market for PC operating systems in 2023. By now, many consultancies report on a broader operating system market that includes all devices: PCs, tablets and smartphones. On that market, Windows's share is much smaller, since in the

cloud computing, the operating system has moved to the sidelines: user experience no longer mostly focuses on the operating system in the manner that it did twenty years ago. Similarly, the applications industry is no longer as dependent on the decisions made in relation to Windows as it used to be. In other words, the operating system has become commoditized, and the creation of value – and the market power – has moved to the web-based content, applications and service providers. This represents a rebalancing amongst complements within a broader ecosystem, in the wake of what would qualify as architectural disruption.

A review of these instances of disruptive innovation demonstrates that the models of competition *in* and *for* the market do not provide a complete account of static and dynamic competition. Once the relevant market is no longer exogenously given and held constant, a third model of “competition *on* the market” emerges, which is more suited to describing disruptive innovation. In that model, the market itself is a competitive parameter:⁷⁶ firms compete in order to disrupt existing market structures, by shifting the value network or by replacing the dominant architectural design. Firms seek to exert influence on the market boundaries, which is bound to affect relevant market definition for antitrust purposes. As a consequence, the definition of relevant product markets becomes endogenous to the competitive process: firms influence it through their competitive strategy. As seen in the examples above, it may be the case that the relevant market will not be re-defined, but its relationship with neighboring markets will change in such a way that it would affect the competitive assessment (if not at market definition, then at another stage).⁷⁷

The difference between competition *in*, *for* and *on* the market becomes clearer once firm strategy and competitive mechanisms are brought into consideration. Firms competing *in* the market try to find the right combination of price, quality, quantity and service that will enable them to gain a modicum of market power in order to reap some profit. Competition *in* the market is

meantime Android-based devices represent a usage base at least comparable to Windows’s, and the majority of new device shipments.

⁷⁶ Hence our designation as competition “on” the market, to put market definition on the same footing as other competitive parameters, i.e., competition on price, on quality, and so forth.

⁷⁷ As noted in the introduction to this article, the European Commission has stuck to its practice of defining narrow relevant markets in Google Search (Shopping), *supra* note 8 and Google Android *supra* note 9. In the context of EU competition law, acknowledging that relevant market definition is effectively endogenous to the competitive process might be too much of a revolution. A more promising path might be to factor in other competitive dimensions, such as competition between ecosystems, as the General Court appears willing to do in *Google Android*, *supra*, note 9, ¶¶ 104–29.

not purely static: firms will frequently innovate in order to try to gain an advantage over their rivals.⁷⁸ That is in essence of sustaining innovation, i.e., innovation taking place within the established value network or the dominant design.

Firms competing *for* the market do not behave much differently. They also look for the right combination along competitive parameters, except that the competitive mechanism runs otherwise. The prize in this situation is not so much some amount of profit being generated in a competitive market, but a large market position that enables the firm to reap a far larger profit, subject to constraints from potential entry. Given scale effects, competition *for* the market requires an entrant to significantly exceed the performance of the incumbent on key competitive parameters, in order to overcome the inertia induced by network effects and to convince customers to switch. Unless, of course, customers multi-home, in which case competition for the market begins to resemble competition *in* the market. The need to overcome these hurdles may explain why competition for the market is rarely observed in practice. For both competition *in* and *for* the market, firms are involved in head-to-head rivalry: they take customers away from one another.

In contrast, our understanding of competition *on* the market is driven by a different strategy, that of disruptive innovation. The disruptor is not competing with the incumbent as a direct rival, but is rather attacking the incumbent more laterally. Competition *on* the market involves firms trying to find an unexploited niche on the demand side (in the case of customer disruption) or an alternative architecture (in the case of architecture disruption). In both cases, the essence of competition is entrepreneurship (in the Austrian sense) and invention: the entrant has an inventive insight, and it tries to bring that invention to the market, gain acceptance and turn it into an innovation with disruptive consequences. Because the incumbent is operating successfully within a sustaining innovation framework, the incumbent is blind-sided and disruption occurs. The reward for the successful disruptor is a position of strength within the new value network or the new dominant architecture, ideally a 'gatekeeper' position where the disruptor can extract a situation rent from the market. The incumbent does not necessarily shrink or vanish; rather, it is sidelined. If the incumbent held a gatekeeper position, it would lose that position and the rents that come with it. This was the fate of Microsoft in the example cited above. If a metaphor can be risked, competition *on* the market is akin to sumo wrestling, where the dohyō (ring) stands for the position of strength sought by the firms: firms try to push one

⁷⁸ In that sense, the perfect competition model is almost like a pathology of competition in the market, where firms have reached a point where they are stripped of any market power and unable to derive profits other than by having lower costs than their rivals.

another out of that position of strength. The losing firm, while kicked out of the ring, remains standing and can mount a rematch.

The following Table provides an overview of how competition *on* the market differs from competition *in* or *for* the market.

TABLE 2: TYPES OF COMPETITION

	Competition <i>in</i> the market	Competition <i>for</i> the market	Competition <i>on</i> the market
Market picture	One market	One market	A number of markets (substitutes or complements)
Market definition	Exogenous and constant	Exogenous and constant	Endogenous and variable
Competitive statics	A number of firms in a market	A dominant firm in a market	A number of larger/smaller players with a base in one or more markets
Competitive dynamics	Many firms compete	Succession of dominant firms	Firms compete for a position of strength
Type of competition	Frontal competition	Frontal competition	Sideways competition
Firm objective	Gain some market power to make profit	Gain dominant position and exploit it	Take position of strength and extract situation rent
Modus operandi	Firms take customers away from one another	Entrant takes market away from incumbent and becomes new incumbent	Incumbent is sidelined, entrant takes position of strength (bottleneck)

Competitive parameters	Price, quality, service, innovation	Price, quality, service, innovation	Value network or architecture
Type of innovation	Sustaining innovation	Sustaining innovation	Disruptive innovation

III. IMPLICATIONS FOR ANTITRUST POLICY

After having reviewed the meaning of disruptive innovation and its implication for the types of competition, we now turn to its implications for antitrust policy. As a preliminary matter, given that disruptive innovation is by definition blind-siding successful and well-run incumbent firms, one can hardly expect antitrust enforcers to see it in real time. In general, any innovation is characterized by a level of unpredictability: innovation comprises an invention and its subsequent diffusion, processes which are stochastic (affected by randomness) by nature. Despite all their efforts, would-be inventors do not always succeed: there is usually an element of serendipity behind most inventions, especially for the most significant ones.⁷⁹ Furthermore, even the most promising invention might not be successfully diffused and adopted amongst the customer population,⁸⁰ in which case it does not lead to any innovation.⁸¹ The element of Knightian true uncertainty⁸² inherent in all innovations is compounded in the case of disruptive innovations, since they go against the grain, i.e., they imply a major event such as shift in the value network or a new dominant design, the occurrence of which may be rife with uncertainty. Accordingly, the question is not so much whether antitrust enforcers can anticipate disruptive innovation – they cannot – but whether they can determine the extent to which disruptive innovation (competition *on* the market) is likely to take place and if so, whether they can reflect this in antitrust analysis and enforcement – i.e. whether a given course of conduct or merger is likely to affect the probability of disruptive innovation.

At first glance, the potential for competition *on* the market could prove reassuring for antitrust law enforcers. Instead of resigning themselves to the presence of a monopolist with limited hope of displacement by the next

⁷⁹ See ROBERT K. MERTON AND ELINOR BARBER, *THE TRAVELS AND ADVENTURES OF SERENDIPITY – A STUDY IN SOCIOLOGICAL SEMANTICS AND THE SOCIOLOGY OF SCIENCE* (2004).

⁸⁰ See the overview of diffusion research in EVERETT M. ROGERS, *DIFFUSION OF INNOVATIONS*, 5th ed. (2003).

⁸¹ Scotchmer, *supra* note 32.

⁸² FRANK H. KNIGHT, *RISK, UNCERTAINTY AND PROFIT* (1957).

monopolist, *à la* competition *for* the market, they could rely on potential disruption as a competitive constraint on the behaviour of the incumbent. Ultimately, if antitrust enforcers are not taking competition *on* the market into account, they do not have a full view of the competitive forces at play.

On the one hand, neglecting competition *on* the market might lead enforcers to underestimate the strength of the competitive constraints weighing on firms. One could argue that this opens the door to Type I (false positive) errors, where the enforcers intervene in circumstances when they should not have done so. Yet in cases where competition *on* the market might play a role in the analysis, the chances are that a large incumbent is present. Conventional analysis will typically result in a finding of dominance and probably point to some anti-competitive conduct that warrants intervention. In any event, given the welfare effects of disruptive innovation, one could argue that a certain amount of Type I error risk could be tolerated when disruptive innovation is at stake.

Aside from the risk of Type I error, another and possibly more fundamental issue is the meaning and purpose to be attributed to antitrust enforcement, especially in sectors prone to technological change. As reflected in the discussion of the *Microsoft* and *Google* cases earlier in this paper, antitrust remedies, however wide-ranging they might have been in those cases, did not move the competitive needle all that much. Competition *on* the market, i.e., disruptive innovation, probably had a greater impact than law enforcement in addressing antitrust concerns in these cases; hence, some humility in enforcement is called for. Whenever it appears that competition *on* the market is a realistic possibility, antitrust enforcement should steer clear of structuralist ambitions, for instance to maintain a competitive structure on the relevant markets at stake by ensuring that a given number of competitors are present. Rather, as some commentators concluded in the aftermath of *Microsoft*,⁸³ antitrust policy will at best have indirect effect on market outcomes. As in *Microsoft*, antitrust enforcements will keep the incumbent on its toes, by reminding it that not all conduct is permissible and ensuring that it maintains its focus on innovating as opposed to excluding its rivals, especially potential disruptors.

On the other hand, and perhaps more interestingly, failing to incorporate competition *on* the market into the analysis might lead antitrust enforcers to fail to censure dominant firm conduct that is designed to undercut potential disruptors – something akin to a Type II (false negative) error. Among other

⁸³ PAGE/LOPATKA and GAVIL/FIRST, *supra* note 4.

factors, the perceived slowdown in disruptive innovation in the 2010s⁸⁴ could be a result of incumbent firms improving their ability to outmatch disruptors, right under the noses of antitrust enforcers. Given that the essence of disruptive innovation is its potential harm to incumbents, improving antitrust enforcement to preserve potential for competition *on* the market – for disruptive innovation – might accordingly involve restraining dominant firms from conduct that might not appear to have any serious anti-competitive impact in the conventional sense, in order to leave these firms exposed to events that might lead to their demise. The past few decades have shown that the effects of disruptive innovation on consumer welfare are positive and significant, vastly outbalancing the losses to incumbents. Safeguarding the potential for competition *on* the market should hence be a priority for antitrust enforcers.

Under this view, the task for antitrust law is two-fold: develop appropriate metrics to capture competition *on* the market (A); and address the theories of harm that arise in the context of disruptive innovation, where the harm follows from the strategic behavior of incumbents (B).

A. NEED TO FIND APPROPRIATE METRICS

Traditional antitrust metrics, as they are used to define the relevant product market or to assess market power, are key to the analysis as they frame the problem and often are closely linked to the solution. They include basic data such as prices and costs, and concepts such as demand and supply substitutability, barriers to entry, market shares, etc. Integrating innovation into antitrust analysis on the basis of these metrics and within the traditional concepts of relevant product market and dominance assessment has proven to be challenging, but it is not impossible. Yet leading cases have in general tended to involve sustaining innovation, as opposed to disruptive innovation. The specificities of disruptive innovation, as outlined earlier, are more difficult to capture with traditional metrics. Integrating disruptive innovation requires an adaptation of current (mostly static) metrics as well as the development of new (more dynamic) metrics.

1. *Current Metrics*

Given that competition *on* the market involves reshaping the market, relevant market definition might not be very informative. Any disrupting

⁸⁴ The argument is made crisply in David Karpf, *Something I No Longer Believe: Is Internet Time Slowing Down?* 5:3 SOCIAL MEDIA + SOCIETY 1–4 (2019). See on this point the data gathered in the US Congress Report, *supra*, note 45, at 46–51. As to the mechanisms at work, see the analysis made in the Furman Report, *supra*, note 68, at 40, 48–50.

entrant will likely not (yet) be competing on the relevant market, as defined prior to any disruption. In the case of customer disruption, or demand-side disruption, the disruptive innovation enables the entrant to enter at the low end of the market, serving neglected or excluded customers; this means that ahead of any attempt at disruption, the entrant will likely be on another relevant market, if it is at all active. For instance, streaming providers (with the exception of Netflix) were not in the market for DVD rentals before the disruption brought about by streaming. In the case of architectural disruption, or supply-side disruption, it is conceivable that the potential disruptor would already be operating on the relevant market when it generates a new dominant design, although this is not a pre-condition. For instance, Apple disrupted the mobile device market with the iPhone, starting from a position outside the market.

Accordingly, on the basis of the way in which product market definition is currently conducted, practices designed to impede disruptive innovation might be the antitrust equivalent of ‘victimless crimes’: no actual or potential competitor is harmed by the practice, even if customer welfare is affected when disruptive innovation is hampered. Antitrust enforcement should therefore not be fooled by the optics of (static) market definition and underestimate the harm to competition and innovation, simply because the incumbent and the potential disruptor are operating on different relevant product markets and there is no horizontal relationship between them at a given point in time.⁸⁵ One way to catch potentially disruptive entrants would be to move the market definition exercise upstream in the innovation value chain.⁸⁶ Enforcers would then be defining technology⁸⁷ or R&D markets,⁸⁸

⁸⁵ For instance, to alleviate such optical mistake, the CRÉMER ET AL., *supra* note 68 suggests for at 11 to ‘inject some horizontal elements into the conglomerate theories of harm.’

⁸⁶ Giulio Federico, Fiona Scott Morton & Carl Shapiro, *Antitrust and innovation: Welcoming and protecting disruptions*, in JOSH LERNER AND SCOTT STERN (EDS), 20 INNOVATION POLICY AND THE ECONOMY (2019), at 137.

⁸⁷ The US DOJ-FTC Guidelines for the Licensing of Intellectual Property define technology market as follows at ¶ 3.2.3: “*consist of the intellectual property that is licensed (the ‘licensed technology’) and its close substitutes—that is, the technologies or goods that are close enough substitutes to constrain significantly the exercise of market power with respect to the intellectual property that is licensed.*” In the EU, see *Servier supra* note 67, at Rec. 1385 and ff.

⁸⁸ The US DOJ-FTC Guidelines for the Licensing of Intellectual Property define an R&D market as follows at ¶ 3.2.3: “*A research and development market consists of the assets comprising research and development related to the identification of a commercialisable product, or directed to particular new or improved goods or processes, and the close substitutes for that research and*

innovation markets or spaces⁸⁹ focused on innovation capabilities, instead of existing products, as we explain below.

However, some current metrics might still be relevant. For instance, market power within the meaning of conventional antitrust analysis remains a useful proxy or filter when it comes to practices designed to impede disruptive innovation. In principle, incumbent firms with monopoly power have sufficient ability and incentives to act against disruptive innovation in order to preserve their power.⁹⁰ Non-dominant firms would presumably have less incentives to prevent such disruption, since they have less to lose (through cannibalization), and they might even benefit from the disruption.⁹¹

2. *New Metrics*

New dynamic metrics must be developed on the basis of the theory of disruptive innovation and neo-Schumpeterian economics. This is an heterodox approach which considers that the performance of firms depends not just on incentives (as in orthodox neo-classical economics), but also on the knowledge possessed by the firm and its capabilities to manage and generate knowledge; what Teece calls the *dynamic capabilities* of the firm.⁹² A key tenet of neo-Schumpeterian economics is that, next to the maximization tasks that firms engage in within the scope of their established routines (to optimize their operations), firms also need to search for new routines in order to deal with changes in their environment. That environment will then select the best new routines, and firms will be rewarded or punished accordingly. In a nutshell, this is the core of the evolutionary theory that underpins most of neo-Schumpeterian economics.⁹³ The search for new routines, which is where innovation – in particular disruptive innovation – can arise, is largely a function of the knowledge and capabilities present in

development. When research and development is directed to particular new or improved goods or processes, the close substitutes may include research and development efforts, technologies, and goods that significantly constrain the exercise of market power with respect to the relevant research and development, for example by limiting the ability and incentive of a hypothetical monopolist to reduce the pace of research and development.'

⁸⁹ This approach was followed in the merger context in Case M.7932 Dow/DuPont [2017] OJ C 353/9 where the European Commission defines innovation spaces at ¶¶ 342–61.

⁹⁰ Richard Gilbert & A. Douglas Melamed, *Innovation Under Section 2 of the Sherman Act*, 84 ANTITRUST L.J. 601, 609 (2021).

⁹¹ We leave aside the possibility of collusion amongst incumbents to prevent disruption.

⁹² This theory is well laid out in Teece, *supra* note 64, in particular Chapter 1, “The Nature and Microfoundations of (Sustainable) Enterprise Performance”.

⁹³ As developed in Nelson and Winter, *supra* note 28.

the firm. Hence, in order for antitrust analysis to capture the potential for disruptive innovation (and competition *on* the market), the ‘dynamic capabilities’ of incumbents and potential disruptors alike would need to be investigated, understood and taken into account by enforcers.⁹⁴

This would take antitrust analysis in a direction that it has thus far eschewed, namely, an inquiry into the internal organization and management capabilities of firms. None of the analytical approaches that have held sway over antitrust law over its more than hundred years of history has argued that organization and management capabilities were prime considerations in antitrust investigations.⁹⁵ The more formalistic early approaches focused on the behavior of the firm as it could be observed from outside. In turn, the structuralist approaches of the mid-20th century focused on market structures, market shares and concentration ratios. The more contemporary approaches advocate a deeper inquiry into the effects of firm behavior on welfare, with the help of economic tools. Nonetheless, they are premised on price theory and rational choice theory and thus treat the firm as a ‘black box’. In addition, the primacy accorded to legal certainty and judicial economy weigh against systematically investigating firm organization and management capabilities. In order for enforcers to determine the likelihood of competition *on* the market, antitrust inquiry will have to complement its current focus on external, observable circumstances with an analysis of the internal workings of firms, the differentiating capabilities of each firm and their respective strategies.⁹⁶

This represents a significant break with tradition and, in operational terms, there are no agreed metrics as yet for this type of inquiry in antitrust analysis. Thus, one of the most pressing issues is how to integrate and

⁹⁴ J. Gregory Sidak and David J. Teece, *Dynamic Competition in Antitrust Law* 5 J COMP L ECON 581 (2009) develop this point in greater detail. Note that this assumes that the potential disruptors can be identified. While the myth of the “garage” inventor continues to catch the public imagination to this day, the reality is that most inventive endeavours take place on a larger – and thus more easily noticeable – scale. Nevertheless, some disruptive innovation will come from small firms that cannot easily be identified *ex ante* as potential disruptors.

⁹⁵ For a crisp overview, see William E. Kovacic and Carl Shapiro, *Antitrust Policy: A Century of Economic and Legal Thinking* 14 J. ECON. PERS. 43 (2000). The European antitrust history is set out in DAVID GERBER, *LAW AND COMPETITION IN TWENTIETH CENTURY EUROPE* (1998). See also STÉPHANE ROUSSEAU ET AL, *BUSINESS LAW AND ECONOMICS FOR CIVIL LAW SYSTEMS* (2021), Chapter 2, 6–65.

⁹⁶ For different reasons, behavioral antitrust advocates a similar evolution. See Amelia Fletcher, *The Role of Behavioural Economics in Competition Policy*, in *CAMBRIDGE HANDBOOK ON THE THEORETICAL FOUNDATIONS OF ANTITRUST AND COMPETITION LAW* (2024) or Amanda P. Reeves and Maurice E. Stucke, *Behavioral Antitrust* 86 INDIANA L J 1527 (2011) for an introduction.

operationalize in antitrust law and policy neo-Schumpeterian economics, which underpins the ideas of competition *on* the market and disruptive innovation.⁹⁷ At this point in time, the closest antitrust comes to looking inside the box is when an efficiency defense is raised and the proffered efficiencies are subjected to likelihood and indispensability tests.⁹⁸ Typically, the internal management of the firm and its strategy will then become relevant. These cases are few and far between because, in order for the antitrust inquiry to venture this deep into business conduct, the case needs fall on the knife-edge between harmful and beneficial effects.

Nevertheless, the typical way in which the efficiency defense is brought together is instructive. Since it is a defense, it only comes into play if and once the antitrust enforcers have sufficiently proved their basic case, be it a restrictive agreement, abusive conduct or a merger running afoul of the applicable compatibility test. That basic case typically rests on traditional competitive metrics, to which enforcers have access and which they can understand and process. Since taking efficiencies into account involves a deeper look into the firm, it is then up to the firm to invoke the efficiency defense and to substantiate it with its own evidence. The burden of unearthing and sorting out information internal to the firm therefore lies upon the shoulders of the party best placed to do so, namely, the firm itself. Provided that the conditions of the defense are well calibrated, firms have an incentive to reveal their most valuable internal information.⁹⁹ As a first step, while antitrust grows more experienced at peeking into the internal workings of individual firms, one could devise procedural rules on the burden and standard of proof, in order to force firms at least to reveal the kind of firm-internal and firm-specific information that is needed to properly assess issues relating to disruptive innovation. To this end, the remaining part of the paper provides some suggestions, as we examine the various theories of harm that could arise.

B. POSSIBLE THEORIES OF HARM

As we explained above in section I.B, the incumbent can follow three lines of defensive strategy to slow down or hinder potential disruptors: block,

⁹⁷ Teece *supra* note 72.

⁹⁸ The anti-competitive effects flowing from the conduct or merger must be indispensable to achieve the efficiencies, i.e., there is no less anti-competitive route available to the parties.

⁹⁹ For instance, in merger control, efficiencies must be shown to be merger-specific: for instance, see the EU Guidelines on the Assessment of Horizontal Mergers [2004] OJ C 31/5 at Rec. 85. This forces the merging parties that wish to rely on the efficiency defense typically to provide the internal strategic documents that they themselves used to decide to embark upon the merger.

copy or buy. None of these strategies are anti-competitive *per se*, but each of them can, under certain circumstances, give rise to a situation that would substantiate a theory of harm for the purposes of antitrust analysis. At first glance, these theories of harm would arise under the provisions concerning monopolization (or the abuse of dominance) or merger control.

1. Monopolization Cases

a. Blocking Potential Disruption

The first defensive strategy against disruption is to take measures that would block – or at least impair – disruptive innovation, if and when undertaken by a rival. For one, where complementary assets are necessary for a potential disruptor to deploy its invention, the incumbent may refuse to give a potential disruptor either access to physical assets or a license to use intangible assets (intellectual property). As a starting point, a refusal to deal is not necessarily harmful to competition and innovation in the long term, since it may work so as to preserve the innovation incentives of the incumbent and its rivals, as explained by the U.S. Supreme Court in *Trinko*¹⁰⁰ and the EU Court of Justice in *Slovak Telekom*.¹⁰¹ This is why a dominant player is in principle free to deal with whom it wishes; it is only under ‘exceptional circumstances’ that such freedom will be overridden and access will be imposed under antitrust law.¹⁰²

¹⁰⁰ *Verizon Communications v. Trinko* 540 US 398 (2004): ‘Firms may acquire monopoly power by establishing an infrastructure that renders them uniquely suited to serve their customers. Compelling such firms to share the source of their advantage is in some tension with the underlying purpose of antitrust law, since it may lessen the incentive for the monopolist, the rival, or both to invest in those economically beneficial facilities’.

¹⁰¹ C-165/19P *Slovak Telekom v. Commission*, ECLI:EU:C:2021:239, at 47: ‘while, in the short term, an undertaking being held liable for having abused its dominant position due to a refusal to conclude a contract with a competitor has the consequence of encouraging competition, by contrast, in the long term, it is generally favourable to the development of competition and in the interest of consumers to allow a company to reserve for its own use the facilities that it has developed for the needs of its business. If access to a production, purchasing or distribution facility were allowed too easily, there would be no incentive for competitors to develop competing facilities. In addition, a dominant undertaking would be less inclined to invest in efficient facilities if it could be bound, at the mere request of its competitors, to share with them the benefits deriving from its own investments.’

¹⁰² The conditions necessary to justify the imposition of compulsory access are different on both sides of the Atlantic. They are easier to meet for the antitrust agency in the EU, which should prove whether: (i) a facility is indispensable to compete on a neighboring market; (ii) the refusal would exclude competition on that market;(iii)

The effects – hence the relevance – of imposing compulsory access with respect to disruptive innovation are even more complex to ascertain than in the case of sustaining innovation. While Gilbert noted that some compulsory licensing agreements had very beneficial impacts on competition and innovation, he also added that “*the 1956 AT&T and IBM consent decrees [...were] powerful stimulants for competition and promoted follow-on innovations that built on the patented technologies.*”¹⁰³ Indeed, the very nature of the intervention – forcing the dominant firm to give access to a facility under its control – is conducive to sustaining innovation, since it compels the opening of a path to ride on the facilities of the dominant firm with a view to competing with that firm on an existing market. Compelling a dominant firm to offer access to its facilities amounts to replacing a difficult bargaining process with a regulated solution, creating a powerful incentive for entrants to opt for a strategy that exploits this new smoother sustaining innovation path with the least effort. It is true that a disruptor could masquerade as a sustaining innovator to gain a foothold near the incumbent,¹⁰⁴ so that disruptive innovation could also be fostered indirectly. On balance, though, compelled access is more likely to bolster sustaining innovation to the detriment of disruptive innovation.¹⁰⁵ In other words, antitrust enforcers should be particularly careful when mandating access obligations in markets susceptible to disruptive innovation.

However, this does not mean that antitrust enforcers should never condemn a refusal to deal on account of its impact on disruptive innovation, since both literature and practice demonstrate that blocking access to complementary assets is a very real defensive strategy. Rather, we would advocate a reworked set of exceptional circumstances to cover cases relating to disruptive innovation.¹⁰⁶ As a starting point, the enforcement agency should build a theory of harm on the basis of the dynamic metrics mentioned earlier to the effect that the incumbent seeks to block a potential disruptor even if that disruptor is not on the same relevant market. More specifically, three “exceptional circumstances” (conditions) should be evidenced by the

the plaintiff intends to offer a new product (only for cases where intellectual property is at stake); and (iv) the defendant cannot offer any objective justification for the refusal to deal: see *Microsoft*, *supra* note 2.

¹⁰³ Gilbert, *supra* note 61, at 239 (our underlining).

¹⁰⁴ For instance, the browser introduced by Netscape could be made to appear as a sustaining innovation, as yet another third-party application, destined to add functionality to the Windows operating system within the existing value network and dominant architecture, and indeed this seems to be how Microsoft saw it at first.

¹⁰⁵ This may have been of the case of the EU Microsoft case, see Larouche, *supra* note 4 at 631.

¹⁰⁶ Similar to the way in which the CJEU introduced an alternate set of exceptional circumstances in cases involving SEP licensing negotiations under FRAND commitments, in Case C-170/13, *Huawei v. ZTE* ECLI:EU:C:2015:477.

enforcer: (i) the access seeker (would-be disruptor) has a credible technology and business model to carry out disruptive innovation, to the detriment of the incumbent; (ii) the incumbent refused to give access or otherwise sought to block access to certain assets; and (iii) access to the assets in question is necessary to carry out the innovation (either to make the invention work or to secure its diffusion). These three conditions can usually be tested without needing to investigate the internal workings of the incumbent, if necessary with information supplied by the complainant. This test requires that the disruption process is somewhat advanced if the exceptional circumstances are to be proven to the requisite standard (i.e. the disruption strategy is sufficiently credible, complementary assets are identifiable and the consequences of refusing to deal can be determined). This reduces the risks of type I error (false positives). But this necessarily implies that antitrust intervention may arrive too late, with the risk of type II errors (false negatives).

Once these three conditions have been established, the burden would then turn to the incumbent to prove that there is a valid and credible justification for such a refusal. Of course, proving such a justification is likely to involve an examination of the internal operations of the incumbent, and this is precisely why the incumbent should bear the burden of proof. Nonetheless, certain externally observable evidence may also be also relevant in this type of exercise. For instance, interruption of a previous course of dealing (as in the US Aspen Skiing case¹⁰⁷ or EU Glaxo case¹⁰⁸) or a discriminatory refusal could indicate a blocking strategy, as opposed to competition on the merits.

In addition to refusals to give access to complementary assets, the incumbent can pursue other courses of action designed to block disruption by making it harder for potential disruptors to gain the necessary foothold on the market. The incumbent may make it more expensive to create a bridge with the existing value network (a classic instance of ‘raising rivals’ costs’ through tied goods, intellectual property protection, etc.) or an overlap with the dominant design (through intellectual property protection, etc.), or it may create or increase switching costs for customers.

Existing antitrust law offer some avenues against such practices. The US Microsoft case is instructive on this point.¹⁰⁹ Even if that case was not framed in terms of disruptive innovation – because the literature was still in its infancy at the time – the threat identified by Microsoft and its response can be seen in that light. Microsoft correctly perceived that, once Netscape distributed its browser across the various computing platforms (Windows,

¹⁰⁷ Aspen Skiing v. Aspen Highlands Skiing 472 US 585 (1985).

¹⁰⁸ C-468/06, Sot. Léllos Kai Sia EE v. GlaxoSmithKline ECLI:EU:C:2008:504.

¹⁰⁹ *Supra* note 1.

MacOS, Linux, Unix) and offered APIs to application developers, programming for the Netscape browser platform would become a real alternative to programming for Windows.¹¹⁰ The so-called ‘application barrier to entry’¹¹¹ that protected Windows could therefore be undermined, leading to the sidelining of Windows and the loss of a substantial part of Microsoft’s significant market power.¹¹² This would have constituted a disruptive innovation, either through customer disruption or architecture disruption, or probably both. Microsoft deployed a strategy that aimed at preventing Netscape from gaining a sufficient foothold to engage in disruption.¹¹³ Some elements of that Microsoft strategy were conventional, such as cutting Netscape from the main channels of distribution at the time (OEMs and ISPs) with a view to limiting its access to users. Similarly, Microsoft sought to undermine Netscape’s cross-platform claim by securing exclusivity to Apple’s MacOS platform. As mentioned above, it was not too difficult to condemn these measures under existing antitrust law.

Other elements of the Microsoft strategy were more daring, such as enmeshing Internet Explorer into Windows in such a way as to make it inconvenient, if not impossible, to replace it with Netscape. That latter part of the strategy – technical bundling – was the most difficult for courts and

¹¹⁰ See the famous “The Internet Tidal Wave” note penned by Bill Gates on May 26, 1995, wherein he instructed his senior managers to turn the firm around to face the threat from Internet-based computing. The then CEO of Microsoft also noted that: *‘Netscape’s strategy is to make Windows and other OSs all but irrelevant by building the browser into a full featured operating system. Over time Netscape will add memory management, file systems, security, scheduling graphics and everything else in Windows that applications require. The company hopes that its browser will become a de facto platform for software development, ultimately replacing Windows as the mainstream set of software standards’*: Testimony of Franklin M. Fisher, 90(i), United States v. Microsoft Corp., No. 98-1232 (D.D.C. filed Jan. 5, 1999) (quoting William Gates, The Internet PC, Apr. 10, 1996), available at <http://www.usdoj.gov/atr/cases/f213400/213457.pdf>.

¹¹¹ The applications barrier to entry would now be called a two-sided market: because of its number of users, Windows attracts application developers that seek the largest audience for their applications. In turn, this bolsters the number of applications available for Windows, which attracts more users.

¹¹² By all accounts, the magnitude of the threat from Netscape was exaggerated. Nevertheless, the scenario envisaged (i.e., the sidelining of Windows) materialized later once the browser assumed the central role in the user experience.

¹¹³ At the time, Microsoft’s strategy was presented as “defensive leveraging” to protect its position in the operating systems (Windows) and applications (Office) markets by gaining control of the nascent browser market. With the benefit of hindsight, this strategy could also be seen as an attempt to hinder disruption by cutting off the browser as a path through which to gain a foothold in the then-current value network and architecture.

enforcement agencies to deal with. When disruptive innovation is taken into account, Microsoft's strategy was in fact to bundle the browser and the operating system in such a way as to force any potential disruptor to compete with an equivalent bundle, thus making it much more difficult and costly for such disruptor to gain a foothold on the market. In principle, Microsoft's decision to bundle Explorer and Windows was respected, on account of Microsoft's innovation arguments; nonetheless, Microsoft had to commit to allow users to install Netscape and to choose it as their default browser, and to allow this choice to be functional.

b. Copying

Aside from attempting to block or hinder disruption, another defensive strategy is simply for the incumbent to espouse disruption, by mimicking the offerings of the would-be disruptor and hoping to beat that rival at its own game. Of the large incumbent firms of today, both Google and Meta have deployed a copying strategy repeatedly, but with mixed results. Faced with the threat of disruption from a shift towards mobile computing with an ecosystem of specific apps that link users with businesses without the use of a search engine (as introduced by iOS), Google responded by creating a rival ecosystem (based on Android which Google had acquired earlier in 2005), which allowed it to avoid being sidelined and led to a position where Google controls the largest of two rival platforms. However, Google's response to the threat of disruption from social networks, Google+, was not successful. Meta was able to avert the threat to Facebook from video-sharing networks such as Snapchat by acquiring a rival (Instagram) and then matching the evolution of the Snapchat offerings at every step. In turn, Meta was less successful with its attempts to mimic other evolving offerings with disruptive potential such as short-form video-sharing networks (e.g., Lasso and then Reels, as a clone of TikTok) or messaging networks (e.g., Threads, as a rival to Twitter/X).

The welfare effects of copying strategies are more ambiguous than blocking strategies. Blocking strategies can truly hinder disruption, whereas it seems that a copying strategy, even if successful, will at most change the course of the disruption. The appearance of Android and Instagram as rivals to iOS and Snapchat, respectively, did not prevent the effect associated with disruption (i.e., changes to the value network or architecture) from happening, but it did usher in a market rivalry instead of crowning a new gatekeeper; ultimately, this is a positive development. As for failed attempts at copying in order to avert disruption, they seem to have at least helped to make the incumbent nimbler and more alert, so that it could remain relevant in the face of disruptive effects.

One could also argue that instead of working with antitrust law, we might be better advised to revert to intellectual property law to improve the

protection afforded to potential disruptors against copycat strategies by incumbents. Although this may seem appealing at first sight, intellectual property law works symmetrically, to the benefit or detriment of all firms, irrespective of their market position. As far as disruptive innovation is concerned, any reform or evolution of intellectual property law that would help potential disruptors ward off copying by incumbents could thus equally help incumbents to better shield the value network or the dominant architecture against attempts at disruption.¹¹⁴ Changing intellectual property law on account of disruptive innovation could thus cut both ways, and might therefore prove to be ineffective. In sum, it seems that while copying strategies to address disruptive innovation could potentially give rise to antitrust concerns, the welfare effects are not as clear as with blocking strategies. As far as monopolization or abuse of dominance are concerned, it might accordingly be preferable to focus enforcement first and foremost on blocking strategies.

2. *Merger Control*

Instead of engaging in courses of conduct that aim to block disruptive innovation or to copy the would-be disruptor, another defensive avenue for the incumbent is to use acquisitions to address the threat of disruption. In the literature, this strategy is often linked to the “killer acquisition” scenario, where the incumbent acquires a potential disruptor in order to eliminate the disruptor as a stand-alone rival, shelve the disruptive innovation and ultimately even avoid any need to cannibalize its own operations.¹¹⁵ Some authors went further and introduced the idea of ‘moats’ or ‘kill zones’, where entry is consistently discouraged by the threat of being bought.¹¹⁶ In these scenarios, both innovation and competition, and ultimately consumer welfare, are adversely affected.

¹¹⁴ In which case there could be a greater need for antitrust or competition law to intervene to curtail the use of intellectual property rights by incumbents, which itself leads to further difficulties, as seen in the discussion of refusal to deal case *supra* note 100 and accompanying text.

¹¹⁵ OECD, *START-UPS, KILLER ACQUISITIONS, AND MERGER CONTROL* (2020). This strategy was previously described and called ‘patent shelving’ by JEAN TIROLE, *THE THEORY OF INDUSTRIAL ORGANIZATION* (1988) at pp. 393–94, referring to Richard J. Gilbert and David M.G. Newbery, *Preemptive Patenting and the Persistence of Monopoly* 72 *AM ECON REV* 514 (1982).

¹¹⁶ Sai K Kamepalli, Raghuram G. Rajan, Luigi Zingales, *Kill zone*, NBER WORKING PAPER 27146 (2020); Motta and Shelegia, *supra* note 51; Scott Morton et al, *supra* note 68 at 53. Having said that, the strategy of entering a market short term with a view to be bought by an incumbent is a highly profitable strategy for small firms seeking to realize profits in the short term without the need for large scale investments.

Empirical evidence on mergers and innovation can be helpful in assessing the salience of killer acquisitions.¹¹⁷ In the pharmaceutical sector, where the concern with killer acquisitions originated, Cunningham et al. found that some 5.3%–7.4% of the acquisitions were of the ‘killer’ type.¹¹⁸ In the digital sector, Gautier and Lamesch submit that it is extremely difficult, even *ex post*, to single out killer acquisitions from the rest, and they note that acquirers prefer to continue with the innovation they acquire rather than killing it, when strong complementarities exist between the incumbent and the would-be disruptor.¹¹⁹ Ivaldi, Petit and Ünekbaş analyzed the effects of some EU merger control decisions in the digital sector and found no factual evidence supporting the killer acquisition theory.¹²⁰ In the sample they studied, they could not observe a disappearance of the products of the acquired firm, a weakening of competing firms or a reduction in entry and innovation after the acquisitions.

If one focuses on the empirical evidence, it would appear that the bulk of acquisitions are put into effect without the intention to terminate the acquired firm, so that the problem of killer acquisitions would be relatively contained, if not marginal. This conclusion is arguably flawed, however, because it assumes that the *only* purpose of acquisition as a defensive strategy is to eliminate the would-be disruptor. The acquisition history of Facebook shows that acquisitions can also be used to support a blocking strategy.

In 2014, Facebook announced that it would buy WhatsApp for a then stunning \$19bn. The acquisition was cleared by both the FTC¹²¹ and the

¹¹⁷ See among others Chiara Fumagalli, Massimo Motta, and Emanuele Tarantino, *Shelving or Developing? The Acquisition of Potential Competitors under Financial Constraints*, CSEF WORKING PAPER 637 (2022); Massimo Motta & Martin Peitz, *Big Tech Mergers*, 54 INFORMATION ECONOMICS AND POLICY (2021); Elena Argentesi, Paolo Buccirossi, Emilio Calvano, Tomaso Duso, Alessia Marrazzo, Salvatore Nava, *Merger Policy in Digital Markets: An Ex Post Assessment*, 17 J COMP LAW & ECO 95 (2021).

¹¹⁸ Colleen Cunningham, Florian Ederer and Song Ma, *Killer acquisitions*, 129 J POL ECON 649 (2021) which define killer acquisitions as ‘transactions aimed toward terminating the development of the target’s innovative product to preempt future competition.’

¹¹⁹ Axel Gautier and Joe Lamesch *Mergers in the digital economy*, 54 INFORMATION ECONOMICS AND POLICY (2021) confirming the theory of Motta and Shelegia, *supra* note 51.

¹²⁰ Marc Ivaldi, M, Nicolas Petit and Selcukhan Ünekbaş *Killer Acquisitions: Evidence from EC Merger Cases in Digital Industries*, DCI WORKING PAPER 4 (2023).

¹²¹ The FTC clearance was obtained when the initial waiting period expired, and therefore no decision was published. Nevertheless, the Director of the FTC Bureau of Consumer Protection, Jessica L. Rich, sent a letter to the parties to remind them about

European Commission,¹²² without any significant hurdles. The reasoning of the agencies is set out in the decision of the European Commission.¹²³ The transaction is deemed to concern three relevant markets: consumer communications services, social networking services and online advertising services. In a nutshell, Facebook and WhatsApp were found to compete only on the first of these three markets, in a competitive environment¹²⁴ where they are not each other's closest competitor. On the latter two markets, the Commission was concerned about the integration of WhatsApp into Facebook's platform, but it accepted a submission by the parties that they would not undertake such an integration.¹²⁵ To an outside observer, especially with the benefit of hindsight, the reasoning of the European Commission in Facebook/WhatsApp appears to be lenient. The Commission simply takes note of the policies and statements of the parties, without asking them to commit to those formally, as a condition for merger clearance. At least the FTC sought to impress upon the parties that they were bound to respect the privacy policy of WhatsApp (and therefore not to merge WhatsApp data into Facebook). When the European Commission ultimately found out that Facebook *was* intending to migrate WhatsApp data to the Facebook platform, it merely fined Facebook €110m for having misled the Commission as to its intentions during the merger review process.¹²⁶

More fundamentally, on the face of the merger control decisions, it is hard to understand why Facebook spent so much money to acquire WhatsApp, if the overlap is so limited and prospective synergies are foreclosed because of policy statements or technical constraints. Speculations

potential liability under Section 5 of the FTC Act (15 U.S.C. § 45) for breaches of their own privacy policies: Letter of 10 April 2014, available at www.ftc.gov.

¹²² European Commission, Decision of 3 October 2014, Case COMP/M.7217, Facebook/WhatsApp.

¹²³ In the absence of FTC decision, it can be assumed that the two agencies converged in their assessment.

¹²⁴ It is interesting to note that the Commission finds that the 'consumer communications apps market has been characterized by disruptive innovation' (Facebook/WhatsApp *supra* note 122, at 21), without explaining how the innovation is disruptive, since by and large the successive apps listed by the Commission (BlackBerry Messenger, Telegram, WhatsApp, LINE, WeChat) are all within the same value network and the same dominant design. Cross-platform availability and encryption are not disruptive innovations.

¹²⁵ *Id.* at p. 29.

¹²⁶ European Commission, Decision of 17 May 2017, Case COMP/M.8228, Facebook/WhatsApp. The Commission did not, and in effect could not, rescind the merger clearance. Had the Commission made the Facebook statements regarding the transfer of WhatsApp data a condition of the decision (either of its own motion or as a consequence of a Facebook commitment), the clearance could have been invalidated in case of breach.

were laid to rest in 2020 when the FTC filed a complaint against Facebook, concerning among others the Instagram and WhatsApp acquisitions.¹²⁷ According to internal documents cited in the complaint, Facebook not only saw WhatsApp as a direct threat, but also feared that WhatsApp could be purchased by a Facebook rival and then used as a springboard to mount a disruptive strategy to sideline Facebook.¹²⁸ As Facebook realized, WhatsApp had a trove of customers and data (contact lists), a global reach and a good reputation, upon which one could easily add functionalities to gain a foothold in social networking. The acquisition was described internally as a “land grab”, easily worth the price paid.¹²⁹ By acquiring WhatsApp, Facebook therefore consolidated its control over a complementary asset and thereby reduced the risk of disruptive entry.

The same story can be told for the Instagram acquisition, which took place earlier, in 2012, and which also did not attract much attention at the time under merger control review.¹³⁰ Here as well, the FTC 2020 complaint reveals that Facebook was failing to come forward with a rival offering to Instagram. While Instagram on its own was threatening Facebook, internal documents also warned of “*the potential for someone like Apple to use [Instagram] as a foothold.*”¹³¹ The Instagram acquisition can also be seen as part of a blocking strategy, namely, to deny any other major firm the ability to buy Instagram and embark upon their own disruption strategy.¹³²

The acquisitions of Instagram and WhatsApp were therefore carried out respectively as part of a blocking strategy by Facebook. When seen in that light, both acquisitions would have at least warranted an in-depth (second stage¹³³) inquiry, if not a prohibition. It remains to be seen whether the FTC will succeed in its a *posteriori* monopolization claim: even though the

¹²⁷ FTC v. Facebook, Case 1:20-cv-3590, Complaint (D.D.C., December 9, 2020). An Amended Complaint was filed on September 8, 2021. A parallel complaint was filed by State AGs, *New York v. Facebook*, Case 1:20-cv-3589 (D.D.C.).

¹²⁸ See the Amended Complaint, id. ¶¶ 107–28. Facebook saw Google as the most likely acquirer of WhatsApp.

¹²⁹ *Id.*, ¶ 123.

¹³⁰ In the United States, the FTC closed its review of the acquisition without any action on August 12, 2012 (FTC File 121-0121). In the EU, the acquisition fell under the EU thresholds; it was cleared by the UK Office of Fair Trading by a decision of August 14, 2012 (OFT File ME/5525/12), on conventional grounds (limited competitive overlap, lack of incentive to engage into vertical foreclosure).

¹³¹ Amended Complaint, *supra*, note 127, ¶¶ 78–106. The citation comes from para. 86. Google or Twitter were also seen as rival acquirers.

¹³² See the Amended Complaint, *supra* note 127, ¶ 66.

¹³³ By taking it to the second stage of merger review under EU law (Regulation 139/2004 (Merger Control Regulation) [2004] OJ L 24/1, Art. 8) or issuing a second request under US law (under the Hart-Scott-Rodino Act, 15 U.S.C. § 18a(e)).

complaint was not well received at first, it was amended and survived a motion to dismiss.¹³⁴ In addition, after its acquisition by Facebook, Instagram was also used as the spearhead for a copying strategy against another potential disruptor, Snapchat; the statements contained in the FTC complaint make it doubtful that Facebook could have carried out that copying strategy without having acquired Instagram beforehand.¹³⁵ Therefore, on a different set of facts, it would be conceivable that an acquisition could also be used to carry out a copying strategy, for instance by allowing the incumbent to jump-start its rivalry with the potential disruptor.

On the basis of the above, acquisitions can be problematic as regards disruptive innovation not just because of the killer acquisition scenario, but also because of their use as part of a blocking or copying strategy. Alongside these scenarios, of course, one finds the typical case where the incumbent acquires a smaller innovative firm in order to integrate a potentially disruptive invention originating from that small firm within its operations, even at the expense of some cannibalization (in a kind of self-disruption). In such a case, the invention in question benefits from all the resources and innovation capabilities of the incumbent, which often make the difference in the diffusion and adoption phase. Here the acquisition will more often than not be beneficial in terms of consumer welfare. As pointed out earlier in our monopolization discussion, given the deep uncertainty about innovation in general and disruptive innovation in particular, it is very difficult for antitrust enforcers – especially when conducting merger control *ex ante* – to reach a conclusion on whether a detrimental or beneficial welfare scenario is in play. In addition to this substantive obstacle, there is also a preliminary hurdle, in that the acquisition needs to qualify for review under the merger control thresholds. Given the nature of killer acquisitions, traditional revenue-based merger thresholds may not be satisfied and such transactions might therefore escape from review.

a. Merger Notification Thresholds

Typically, when an incumbent firm acquires a potentially disruptive entrant, the latter is still in the start-up phase. However, because disruption can be very costly to the incumbent, it will be ready to pay a high price for the acquisition price, as a premium for control over the disruption process. To be sure, the high price may also reflect important future revenues expected from the disruptive innovation, which means that it does not indicate of itself that the merger is detrimental to welfare. In concrete terms, the incumbent

¹³⁴ FTC v. Facebook, Case 1:20-cv-3590, Memorandum Opinion (D.D.C., January 1, 2022). Other parts of the complaint, not concerned with the acquisitions of Instagram and WhatsApp, were dismissed.

¹³⁵ *Id.*; *id.* at ¶ 91 (laying out the reasoning of Mark Zuckerberg in greater detail).

will inevitably be a large firm with a significant turnover, while the entrant will have a limited turnover, with little or no earnings. These acquisitions therefore stand out through their unusually high price/earnings ratio.

The advantage enjoyed by US antitrust regulators is that, under the US premerger notification system set out in Section 7A of the Clayton Act,¹³⁶ the thresholds for notification are defined by reference to the value of the transaction; these thresholds are sufficiently low that the acquisition of a start-up should still qualify for notification to the FTC. In the EU, by contrast, the notification thresholds are based on the turnover of the firms involved in the transaction, not the value of the transaction.¹³⁷ Such turnover-based thresholds are problematic when an incumbent firm buys a potential disruptor early in its life, when the disruptor still has a low turnover. Moreover, in the digital area, start-ups often begin by offering their products for free, thus rendering a turnover-based threshold meaningless. Hence, a problematic merger as regards disruptive innovation might not be subject to the EU-level notification obligation. It would then fall to be assessed under applicable antitrust laws of the Member States, where it might also fall under the thresholds because of the negligible turnover of the target. Tellingly, the Facebook/WhatsApp transaction, valued at \$19bn, did not meet the EU-level turnover thresholds, and had to be brought before the Commission through the complex Member State referral mechanism that is available under the EU Merger Regulation.¹³⁸

In order to remedy this perceived gap in coverage, several commentators have suggested that the current EU turnover threshold regime be complemented with a new transaction value threshold¹³⁹ or, in the particular case of the digital sector, that the largest platforms (“Big Tech”) systematically notify *all* of their acquisitions.¹⁴⁰ Ultimately, the EU did not

¹³⁶ 15 U.S.C. § 18a.

¹³⁷ EU Merger Control Regulation, Art. 1. The current EU-level primary thresholds are a combined worldwide turnover of € 5bn, with each of the parties (acquirer and acquired firm) achieving at least € 250m in turnover within the EU.

¹³⁸ *Id.*, Art. 1(3): an acquisition falling below the primary thresholds of Art. 1(2) will still have a Union dimension if it meets a set of lower turnover thresholds in at least three Member States. This is a safety net to avoid that acquisitions end up being notified in three and more Member States, where an EU-level notification would have been preferable. This is where Facebook/WhatsApp fell, and the merging firms requested successfully that their transaction be reviewed at EU level, pursuant to Art. 4(5).

¹³⁹ Fumagalli, Motta, and Tarantino, *supra* note 117, for which the high price of the acquisition should not only be an indicator to screen the merger but also to prohibit the merger as high-valued start up should probably be able to find financial resources on their own.

¹⁴⁰ Furman Report, *supra* note 68.

change its general notification threshold regime but sought to further facilitate the referral of below-threshold concentrations acquisitions to the Commission by the antitrust agencies of the Member States.¹⁴¹ This was complemented by the addition to the Digital Markets Act of an obligation on the firms designated as gatekeepers under the Digital Markets Act to inform the European Commission of *all* their acquisitions.¹⁴² It remains to be seen whether these legal reforms will suffice to fill the coverage and information gap.

b. Merger Assessment

Once a merger is notified, the antitrust agency will assess whether it falls foul of the respective standards of review, namely, “substantial lessening of competition” (SLC) under US law¹⁴³ or “significant impediment to effective competition” (SIEC) under EU law.¹⁴⁴ In practice, the agency should answer two questions: (1) what is the effect of the acquisition on innovation? ; and (2) what is the effect on competition?

The first question requires the agency to distinguish between those cases where the incumbent rides on the disruptive innovation and effectively self-disrupts post-merger, and the cases where the incumbent carries out an acquisition as part of a defensive strategy (blocking, copying or killing the disrupter). In terms of substance, given the peculiar nature of disruptive innovation, where the entrant uses innovation to compete *on* the market to upset the incumbent, it seems to us that the inquiry should first focus on the potential cannibalization effect. To this end, it would first be necessary to determine whether there a plausible scenario where the target firm (the entrant), using the invention at its disposal, could carry out disruptive innovation and undermine the market position of the acquirer (incumbent). If that is an unlikely scenario, the antitrust inquiry need not proceed further. Second, if the response is in the affirmative, the next issue would be to ascertain how the post-merger cannibalization effect (the self-disruption) would affect the incentives of the incumbent. For example, are the gains to

¹⁴¹ Communication from the Commission Guidance on the application of the referral mechanism set out in Article 22 of the Merger Regulation to certain categories of cases, O.J. [2021] C113/3. This new approach has been validated by the General Court of the EU in T-227/21 *Illumina and Grail v Commission*, ECLI:EU:T:2022:447.

¹⁴² Digital Markets Act, *supra* note 69, Art.14. The first set of designated gatekeepers includes, unsurprisingly, Apple, Amazon, Alphabet (Google), Booking, ByteDance (TikTok), Meta and Microsoft.

¹⁴³ Section 7 of the Clayton Act, 15 U.S.C. § 18.

¹⁴⁴ EU Merger Control Regulation, Art. 2(2) and 2(3). After a turbulent period in the 1990s and early 2000s, the substance of merger assessment has been largely aligned on both sides of the Atlantic, since the EU reformed its law in 2004.

be expected from self-disruption (taking uncertainty into account) larger than the losses to be incurred? The answer to that question is likely to be correlated to the market position of the incumbent: the more market power the incumbent holds, the larger the cannibalization effect and thus the greater the incentive and ability of the incumbent to try to avoid disruption altogether (using the acquisition as part of a defensive strategy), rather than integrating the invention and effectively self-disrupt.¹⁴⁵

To answer those difficult questions, the agency could rely on the capabilities checklist proposed by Petit and Teece to assess the acquisition of nascent competitors which may bring all types of innovation: “(1) the acquiring firm has monopoly power, (2) the nascent firm’s technology has passed proof of concept, (3) the nascent firm has a proven business model to monetize the technology,¹⁴⁶ (4) the nascent firm has an existing entrepreneurial leadership and strong dynamic capabilities to carry it forward for at least 5–10 years . . . or has a credible succession plan in place, (5) documents from target and acquiring firm indicate that the technology will be disruptive to core revenue streams of the acquiring firm and that the target has a viable business model for value capture, (6) the technology of the nascent firm is not competition-enhancing (complementary) to the acquiring firm.”¹⁴⁷ In order to carry out this assessment, antitrust agencies must inquire directly into the internal documents and business plans of the incumbents and the disruptor, even if (as pointed out earlier) this is unusual under merger control.¹⁴⁸

Even if the agency conclude that the acquirer is likely to embrace the potentially disruptive invention, a further question is whether the acquisition would nevertheless *reduce future competition*. This is in line with conventional merger control analysis. To answer this question, the agency should assess the closeness of potential competition. If the acquirer is a close potential competitor of the target and if there are other possible acquirers which are less close competitors, the agency would be advised to prohibit the acquisition.¹⁴⁹ This might have offered an additional path, for instance, to

¹⁴⁵ Hemphill and Wu, *supra* note 50, at 1891.

¹⁴⁶ This element on the checklist is perhaps too narrowly formulated, since the nascent firm can also be used as a steppingstone by another firm intent on carrying out a disruptive innovation strategy, as was the case in the acquisitions of Instagram and WhatsApp by Facebook.

¹⁴⁷ Nicolas Petit and David Teece, *Capabilities Checklist for Mergers with Nascent Competitors*, 14 J EUR COMP LAW & PRACTICE 135 (2023).

¹⁴⁸ Hemphill and Wu, *supra* note 50, at 1904.

¹⁴⁹ *Id.* at 1892.

block the acquisition of Instagram and WhatsApp by Facebook, on account that another acquirer would have been preferable.

Agencies therefore face a daunting task on substance, having to explore the strategies of each firm involved, as well as their respective dynamic capabilities. As with monopolization cases, this is a situation where procedural rules can help to ease the task of the agency. We would suggest a three-step procedure be adopted, modelled along the lines of the efficiency defense. First, the agency would have to show, on the basis of evidence at hand, that there is a plausible disruption scenario against an acquirer with significant market power (essentially assessing whether points 1 to 4 of the Petit and Teece check-list are satisfied). Second, the burden would then shift on to the merging parties to produce evidence that the acquirer has the incentive and the ability to integrate the target within its operations, i.e., to self-disrupt (addressing points 5 and 6 above in the negative). More specifically, the acquirer should be able to give a clear and convincing explanation why it will embrace the invention upon which the target could have relied upon to attempt disruption.¹⁵⁰ Third, should the agency not be convinced by the acquirer's arguments, it should be in an informational position to compel the production of the requisite documents to prove conclusively that the acquisition forms part of a defensive strategy against potential disruption. If necessary, the agency could accept a commitment from the parties to assuage its concerns. Otherwise, if the third stage provides the agency with the requisite evidence, the conclusion should be that the acquisition is likely to be used as part of a defensive strategy against disruption (block, copy or kill), that such a strategy meets the SLC or SIEC test, as the case may be, and that the merger should be prohibited.¹⁵¹

Next to the burden of proof, the standard of proof should also be adapted. Several commentators recommend that such standard should be framed to encompass not only the probability that a given scenario would occur, but also that the potential harm or benefit be attached to that scenario. Otherwise, relatively improbable scenarios that bring about significant harm or benefit

¹⁵⁰ Gilbert, *supra* note 61, at 237; Id.

¹⁵¹ An alternative procedural solution, advocated in the *Platform Competition and Opportunity Act of 2021* H.R. 3826 (a bill which has not progressed since its tabling), would be simply to reverse the burden of proof and presume that all acquisitions by large platforms entail an SLC or SIEC, as the case may be, unless the merging parties can prove otherwise. Leaving aside the issue of figuring which firms would be put under such a presumption, introducing such a presumption solely to address issues with disruptive innovation would be a disproportionate reaction. Some commentators find that such a presumption would be disproportionate, even if all the concerns surrounding acquisitions by large platforms are put in the balance: see Furman Report *supra* note 68.

might be discounted in the analysis. As is well understood, innovation is rife with uncertainty, including in the Knightian sense which cannot be readily translated into probabilities, yet it holds the promise of significant benefits for competition and welfare.¹⁵² Focusing only on probability while ignoring harms and benefits would thus increase the risk of type II errors (i.e., a harmful clearance) which can be very costly. This reasoning is even more compelling in the case of disruptive innovation, which is almost like the mirror of a ‘Black Swan’ event, with a very low probability but very high benefits.¹⁵³

Antitrust agencies may also impose more sophisticated merger remedies such as contingent remedy designs, namely, remedy designs which may unfold in different ways over time depending on the evolution of innovation and competition on the market.¹⁵⁴ For instance, should the use of acquisition for defensive purposes only become apparent once the merger has been approved and carried out, the agency could revoke the approval. Alternatively, the agency may treat the actions of the acquirer as anti-competitive unilateral conduct within the meaning of provisions such as Article 102 TFEU, Section 2 of the Sherman Act or their equivalents.¹⁵⁵

CONCLUSION

Disruptive innovation is occurring at a greater pace than before, and it is likely to remain a popular business strategy for entrants. By now, business and management literature, relying in large part on heterodox economics, has developed a solid understanding of disruptive innovation – how it occurs, what it entails, how to embrace it (for the entrant) and how to counter it or espouse it (for the incumbent). It centers around two complementary models – customer disruption and architecture disruption – both of which share the defining feature that incumbents suffer from disruption even if they are by all accounts well run. Because of these characteristics, disruptive innovation is

¹⁵² Furman report, *supra* note 68; Hemphill and Wu, *supra* note 50, at 1879; Motta & Peitz, *supra* note 117; OECD, *supra* note 115, at 38; Scott Morton et al, *supra*, note 68. Luis Cabral, *Big Tech Acquisitions*, CEPR DP18272 (2023) shows that moving from balance of probabilities to balance of harms leads to a 15% welfare increase.

¹⁵³ NASSIM NICHOLAS TALEB, *THE BLACK SWAN: THE IMPACT OF THE HIGHLY IMPROBABLE* (2010).

¹⁵⁴ Jorge Padilla and Jacque Cremer, *How to Make Competition Policy Fit for the Digital Age?*, CONCURRENCES (2019)

¹⁵⁵ Hemphill and Wu, *supra* note 50, at 1908. Luis Cabral, *Merger Policy in Digital Industries*, 54 INFORMATION ECONOMICS & POLICY (2021) recommends to strengthen the *ex post* antitrust tools instead of the *ex ante* ones.

both fascinating and challenging for antitrust law. In a sense, the disruptive effect is felt not only on the market, but also on the law policing that market.

Disruptive innovation exposes the shortcomings of current antitrust theory concerning the inclusion of dynamic effects into antitrust analysis. Some literature, with an eye to digital industries, has proposed a model of competition *for* the market – as contrasted with competition *in* the market – that would justify differences in how antitrust policy applies to those industries. Competition *for* the market, however, does not occur so frequently in reality and has not been well received in antitrust practice. In part, this is because it tries to fit the assessment of dynamic effects within an essentially static analytical framework. Disruptive innovation gives rise to competition *on* the market, where the relevant market, the mainstay of conventional antitrust analysis, is no longer held constant, but is part of the competitive dynamic. The aim of competition is then not so much to gain an advantage via price, quality, service or innovation, but rather to shift the value network or to replace the dominant design, i.e., to carry out disruptive innovation, in such a way as to achieve a position of strength within a larger eco-system. Competition *on* the market is lateral competition.

Because of these characteristics, competition *on* the market – or rather, the likelihood thereof – is hard to measure using conventional antitrust law metrics. Nevertheless, it is clear that competition *on* the market takes place, and this calls for a note of caution in antitrust enforcement in order to avoid type I errors (false positives). At the same, competition *on* the market could also justify an extension of antitrust law scrutiny, in order to prevent Type II errors (false negatives). Some of the incumbent strategies advocated in the business literature – controlling complementary assets and making it harder for the potential disruptor to enter the market, copying the innovation of the disruptor, acquiring the disruptor to kill its innovation – may fall foul of antitrust law. While we are still only beginning to explore how disruptive innovation interacts with antitrust analysis, many propositions already emerge from our analysis.

First, while conventional metrics and analytical tools retain relevance, they must be used carefully when it comes to disruptive innovation. In line with the state of economics, these tools are mostly static and rely on static metrics. Relevant product market definition, for instance, can cause antitrust enforcers to miss out on disruptive innovation, as happened in the *Facebook/Instagram* and *Facebook/WhatsApp* merger cases. Market power, by contrast, remains a useful filter through which one can focus on firms whose conduct is likely to affect disruptive innovation significantly.

Second, antitrust analysis needs to expand in less chartered territory and to use new metrics in order to factor in disruptive innovation. Disruptive

innovation – because it highlights the limits of firm management within a conventional model – brings into sharp focus how difficult it is to incorporate dynamic effects into antitrust analysis. Antitrust analysis needs to open up to management theory and heterodox economics, and this implies paying more attention to the internal workings of firms, their knowledge and their capabilities. Firms should no longer be treated as a set of interchangeable black boxes. Each firm has its own dynamic capabilities and its own strategy.

Third, disruptive innovation thus puts antitrust enforcement in a bind: there is already considerable uncertainty around innovation, the new metrics are less well understood, and the relevant information is held deep inside the firms. Antitrust analysis is not used to venturing inside the black box, except in cases that go down the wire into debates over efficiency defenses. These cases offer a procedural path to help antitrust enforcers: splitting the inquiries into steps and reversing the burden of proof from one step to the other can incentivize the firms to reveal the information that enforcers require.

Fourth, the typical defensive strategies against potential disruption (block, copy or purchase) provide a useful guide to assess how monopolization provisions and merger control could be developed. Under monopolization provisions, blocking strategies are most significant. They involve depriving potential disruptors of complementary assets that are needed to embark upon a disruption strategy, through conduct such as a refusal to deal, bundling and exclusive deals to foreclose access to customers, or even by cementing the value network or dominant architecture into a standard. We advocate a new set of “exceptional circumstances” for overriding a refusal to deal, tailored to the specific case of blocking access to complementary assets. As for merger control, “killer acquisitions” are not the only concern; the aftermath of the respective Facebook/Instagram and Facebook/WhatsApp cases illustrate that acquisition can also be used to implement a blocking strategy. We have put forward a three-step approach to assessing mergers touching upon disruptive innovation, designed to enable enforcers to gain insight into firm strategy and capabilities.

In the light of the above, a tentative normative proposition could be formulated. On the assumption that public policy should strive to leave the door open for disruptive innovation to occur, it could be argued that antitrust policy – and more generally economic policy – should push incumbents towards innovation strategies based on their own efforts rather than on acquisitions (except in cases where it can be shown that the acquisition will lead to self-disruption).¹⁵⁶ Furthermore, within the set of own-effort

¹⁵⁶ This must be carefully calibrated since the prospect of acquisition by a larger player is a major source of incentives for startups. Ultimately, discouraging

strategies, copying should be preferred to blocking. Pushing incumbents towards own-effort strategies turning around anticipating or copying could also be beneficial for innovation across the board, disruptive or not, in that it would create more room for diverse solutions to be offered to customers and thus leave more potential innovation paths open.

Finally, and more fundamentally, it might be advisable to take a step back before jumping ahead. Disruptive innovation presents the opportunity for significant gains in consumer and social welfare. By its very nature, however, disruptive innovation is difficult to discern even for firms facing it or trying to pursue it. Antitrust policy can then evolve in order not so much to protect disruptive innovation (let alone to foster it), but rather to ensure that it can happen and will not be thwarted by incumbent firms. Disruptive innovations, more than other innovations, depend on diffusion and adoption. A good idea alone will not shift the value network or herald a new dominant design. Adoption is critical. Accordingly, keeping markets open is essential. It might therefore be advisable for enforcers and regulators to pay more attention than before on the protection of the process of competition as such – in the form of access to the value network or the dominant design, for the potential disruptor to gain a foothold from which to carry out its strategy – rather than focus mostly on consumer welfare, as measured through a static competition bias.¹⁵⁷

incumbents (read major digital platforms) from relying too heavily on acquisitions might end up broadening the pool of potential acquirers to include other large firms. Startups would then still be able to pursue a strategy geared towards an acquisition by a larger player, albeit perhaps at a lower price than could have been obtained from one of the major platforms.

¹⁵⁷ With its focus on contestability, the DMA *supra* note 69, goes in the right direction. The DMA defines contestability as “the ability of undertakings to effectively overcome barriers to entry and expansion and challenge the [incumbent] on the merits of their products and services” (at Rec. 32.). Neither the recitals nor the provisions of the DMA, however, explore the relationship between contestability and disruptive innovation. See Larouche and de Streel *supra* note 70.

ABSTRACT

This paper analyses how disruptive innovation fits within current antitrust policy and practice. It first reviews the business literature on disruptive innovation, and its origins in neo-Schumpeterian economics. Disruptive innovation occurs when the incumbent firm is displaced despite, or even because of, the choices that made that firm successful. As such, it highlights shortcomings of current antitrust theory: models of competition *in* or even *for* the market fail to account fully for dynamic effects. Disruptive innovation represents competition *on* the market, where the relevant market is endogenized and becomes a competitive parameter. Competition *on* the market is, in our view, characterized by lateral (as opposed to head-to-head) competition, where an entrant tries to gain a position of strength within a larger ecosystem, by shifting the value network or by replacing the dominant design at the expense of the incumbent. The paper analyses how competition *on* the market could be factored into antitrust analysis and practice on the basis of recent cases in the US and the EU. The presence of competition *on* the market should lead to greater caution and humility in the application of antitrust law. Nevertheless, antitrust law already has a mixture of substantive and procedural rules that can be harnessed to address concerns related to the main defensive strategies used by firms to prevent disruptive innovation taking place. In the case of monopolization provisions, addressing conduct aimed at blocking access to complementary assets is the most pressing issue. Under merger control, it is not only “killer acquisitions” that are problematic, but also acquisitions designed to deny a foothold to a potential disruptor or to copy its offerings. We explore how antitrust metrics and theories of harm could evolve in these respects, and offer some concrete proposals as regards their implementation.