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CHAPTER 2

TECHNOLOGICAL INFRASTRUCTURE
AND THE EU ESSENTIAL
 FACILITIES DOCTRINE
I. INTRODUCTION

As chapter 1 has discussed in detail, competition policy has an important role to play in structuring strategic behaviour in the market. When private companies self-organise access regimes to technological infrastructure or attempt to use intellectual property strategically to block access or extract monopoly rents, their behaviour reflects their internalisation of both the legal and business risks in the marketplace. This behaviour occurs in the shadow cast by legal rules. One important function of good legal rules is to structure private incentives to track socially-optimal outcomes, as described in chapter 1’s ‘infrastructural approach’. Although referred to frequently by name in that chapter, the ‘essential facilities doctrine’ (‘EFD’) component of this approach was not developed or analysed in significant detail. This omission was for two main reasons. First, the focus of chapter 1 was to develop and defend the ‘infrastructural approach’ in general, by integrating the case law and economic arguments as applied to de facto and cooperative standards. Given the existing literature already applying the infrastructural approach to the EFD, the core contribution of chapter 1 was to bring cooperatively-set standards within the same framework. Second, the EFD remains a controversial doctrine, both in the EU and the US, meaning it requires individual and detailed treatment on its own terms. That is the purpose of this chapter.

A core carry-over insight from chapter 1 is that the proliferation of both real and virtual networks in the modern economy has led to increasing reliance on privately-provisioned technological infrastructures. As the reach of these infrastructures spills over into derivative markets and the scope of the rights over them expands due to network effects, they have attracted increasing regulatory attention due to exclusive ownership creating access problems, self-preferencing issues, or privacy concerns.

In regard to competition law-related problems, which includes both access issues and self-preferencing, the EU Commission has recently launched a number of investigations against Alphabet Inc, the holding company of the Google software giant. In so far as these charges...
are defensible under EU competition law, a number of legal scholars have argued that the most likely legal rule to be applied is the Art 102 TFEU essential facilities doctrine.\footnote{For a critical view, see Vesterdorf, ‘Theories of Self-Preferencing and Duty to Deal - Two Sides of the Same Coin?’, for the rebuttal, see Petit, ‘Theories of Self-Preferencing Under Article 102 TFEU: A Reply to Bo Vesterdorf’.}

This chapter examines the EFD in both its legal and economic dimensions, by focusing on leading EU cases in the area. Specifically, it will confine the core of its analysis to the 2007 Court of First Instance (now General Court, hereafter ‘GC’) decision on Microsoft, due to the fact the latter is the only EFD decision to date to exhaustively consider the competition law issues around de facto technological infrastructure\footnote{Of course, the phrase ‘de facto technological infrastructure’ was not used in this case. Instead, this case concerned de facto technological standards. Chapter 1 of this thesis attempted to show how de facto standards are a subset of technological infrastructure.} in a network industry. The main focus of this chapter will be to try to determine to what extent the EFD shaped the reasoning of the Court in this case. It will include a general examination of the main nerve-centres of the field: the relation between competition law and intellectual property rights; the special characteristics of high technology industries; and the ‘public good’\footnote{See Link and Scott, Public Goods, Public Gains for a definition of ‘public good’, effectively one which is non-rivalrous and non-excludable.} and ‘infrastructural’ nature of privately owned de facto technological standards. Discussion of these issues will be situated within the following. After this Introduction, Part II will be divided into two sections; the first section will look at the factual and legal background of the case; the second section will then engage a detailed examination of the EFD in the abstract. This will provide the intellectual tools and theoretical touchstones necessary for Part III and IV. In Part III the GC’s reasoning will be analysed ‘blow by blow’ to see to which extent the EFD was actually applied. Part IV will then provide a commentary, arguing that the EFD (albeit, a ‘revamped’ EFD) did play a major role in shaping this case’s outcome, and furthermore, for good legal and economic reasons. The relevance of the key economic and legal elements of this decision for the recent EU Commission’s antitrust investigation into Google’s Android mobile OS will also be briefly discussed before offering a brief conclusion.
II. BACKGROUND: LEGAL AND ECONOMIC

A. Factual and Legal Background

1. The origin of the complaint against Microsoft and the Commission Decision

The Commission’s investigation into Microsoft’s alleged abuses of its dominant position was triggered by a complaint by Sun Microsystems Inc. ("Sun") on 10 December 1998. The complaint stated that Microsoft’s refusal to supply ‘inter-operability information’ to its Windows Operating System (‘OS’) prevented Sun’s networking software from being able to successfully interoperate with Windows, and thus prevented it from viably competing on the work-group server operating systems market, in breach of Art 82 ECT [now Art 102 TFEU].

The Commission decision, adopted on 24 March 2004, detailed two abuses: firstly, the one outlined in Sun’s complaint, which was found by the Commission to form ‘part of a general pattern of conduct’ to weaken competitors and eliminate them from the market, and second, Microsoft’s tying of its Windows Media Player to its Windows client PC OS. Only the first of these two abuses will be considered in this chapter.

The remedies and fines ordered by the Commission included the disclosure of the requested interoperability information to Microsoft’s competitors in the secondary market, and a fine of EUR 497,196,304.

2. Microsoft’s action before the GC

The case before the GC constituted Microsoft’s appeal of the Commission decision. Microsoft sought to get the orders annulled or, alternatively, the fine substantially reduced. The crux of Microsoft’s argument was that the requested interoperability information was the subject of IPRs, and that an order to license would interfere with these rights. Furthermore, Microsoft argued that the legal criteria for compulsory licensing were not met in this case.

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310. i.e., the technical information necessary to enable competing work group server OS to be compatible with the Windows OS platform. In particular, the version of Windows at issue is Windows 2000.
311. Treaty of the Functioning of the European Union
313. Ibid, para 573. This point is important as Art 102 TFEU protects ‘competition’ per se, not a competitor. If Sun was the only victim of Microsoft’s behaviour (and if it had no harmful effects on consumer welfare) then Art 102 would likely not have been triggered.
314. To be precise, Microsoft was ordered to disclose: ‘complete and accurate specifications for the protocols used by Windows work group servers in order to provide file, print and group user administration services to Windows work group networks.’ Commission Microsoft Decision, para 999
315. In subsequent proceedings focussing on non-compliance with the 2004 Decision, this fine was increased to EUR 860 million, see Case T-167/08 Microsoft Corp v Commission (27 June 2012) ECLI:EU:T:2012:323.
316. Ibid, para 111.
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B. EFD in the abstract: legal and economic foundations

The purpose of this section is to come to grips with the EFD as it appears in the economic and legal literature and judicial decisions in the EU. The status of the EFD in the United States ("US")- the legal 'home land' of the doctrine- will also be considered. This inquiry will then function as the touchstone for the analysis of the GC decision in the following analytical Part.

1. Legal foundations of the EFD: the EU context

It is important to note at the outset that the EFD has never been expressly referred to in any European Court of Justice decision to date. Although the preponderance of academic literature recognises the existence of the doctrine, there is also a vocal strain who argue that the EFD is not part of European law. Many of these critics argue that the so-called ‘essential facilities’ cases were decided according to a traditional ‘refusal to supply’ analysis, and that the EFD adds nothing new. Proponents of the EFD argue that although not express, the EFD was implicit in the reasoning of these cases. Indeed, Attorney-General (“AG”) Jacobs when analysing the so-called “EFD case-law” in Bronner stated that these cases could either be understood as an application of the essential facilities doctrine, or more traditionally, as a response to a refusal to supply goods or services. While some EFD proponents view these two lines of cases as representing separate legal rules, this chapter will follow the Commission’s stance and that of Cyril Ritter’s in viewing the EFD as a sub-set of ‘refusal to supply’.

One powerful proponent of the EFD is the European Commission. The first use of the EFD in the European Community ("EC") was in the Commission decision B&I Pipe Line Plc. v

318. Doherty, ‘Just What Are Essential Facilities?’, 397 (“...it has been said that the doctrine has become an empty label and, in turn, has fostered a misleading approach to antitrust analysis and leads to judging by 'catch phrase'...”)
321. Ibid, para 65.
323. See Commission Guidance on Enforcement of Art. 82 EC, where the EFD is classified as a sub-category of ‘refusal to supply’, para 78.
Sealink. In that decision, the Commission laid out the principles underlying the EFD in European law:

the owner of an essential facility which uses its power in one market in order to protect or strengthen its position in another related market, in particular, by refusing to grant access to a competitor...infringes Art [82].

As mentioned in this case, a crucial aspect of the EFD is that access to the ‘essential facility’ is a conditio sine qua non for competitors to be able to enter the market. These general principles underlying the EFD have since been refined, itemised, and extended by subsequent Commission decisions and GC and ECJ judgments. Besides the test of ‘essentiality’ (since refined by Bronner), the application of the EFD also requires that the refusal to supply is ‘likely to eliminate all competition’ in the secondary market; and in the special case of IP, ‘prevent the development of the secondary market to the detriment of consumers’ by stopping the emergence of a ‘new product’. Furthermore, there must also be an absence of ‘objective justification’ on the part of the dominant undertaking.

a) The EFD in its wider context: function and origin

As a legal concept under Art 102 TFEU, the EFD’s function is to restrain the abuse of market power by dominant undertakings. In order for the EFD to be applied, all the usual requirements of Art 102 must be met, such as: the demonstration of dominance; an effect on inter-Member State trade, and the finding of an abuse. The EFD is thus not an extension

327. Bronner, para 41. This requirement was modified by the Microsoft case to ‘effective competition’, see Bo Vesterdorf, ‘Article 82 EC: Where do we stand after the Microsoft judgement?’ (2008) Glob Antitrust Rev 1, 8 (“this shift from elimination of all to elimination of effective competition appears to have at the same time rendered the conditions for finding an infringement of Article 82 EC [now 102 TFEU] less strict by loosening the conditions for finding an abuse in these situations”.
328. Referred to as ‘exceptional circumstances’ in the case law, see Joined Case C-241 & Case 242/91P, Radio Telefis Eireann (RTE) and Independent Television Publications Ltd (ITP) v Commission of the European Communities (Magill TV Guides), Commission Decision [1995] ECR I-743, para 49 (“...the exercise of an exclusive right by the proprietor may, in exceptional circumstances, involve abusive conduct.”)
329. IMS v NDC, paras 48-49.
331. A de minimus rule also applies here, such that the effect must be more than ‘negligible’, see Commission Guidelines On the Effect On Trade Concept Contained in Articles 81 and 82 of the Treaty [2004] OJ C101/07 27.4.2004 (“[t]he effect on trade criterion confines the scope of application of Articles 101 and 102 TFEU to agreements and practices that are capable of having a minimum level of cross-border effects within the EU.”)
332. In the case of the EFD the abuse is exclusionary, rather than exploitative.
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of the usual scope of Art 102 TFEU. The doctrine addresses a particular category of abuses by a particular kind of dominant undertaking: the restriction of access to an essential input by an undertaking which owns that input. The usual category of undertakings which meet these requirements is the so-called ‘natural monopoly’. Natural monopolies are characteristic of ‘network industries’, where the impossibility (or extreme difficulty or inefficiency) of reproducing a facility or ‘infrastructure’ logically (and logistically) leads to one undertaking having control over it. A classic example is given by the facts of Terminal Railroad Association, the 1912 US case which first pioneered the EFD. In that case, a group of entrepreneurs owned the only railroad bridge crossing the Mississippi river and prevented competitors from accessing it. The Court ordered mandatory and non-discriminatory access, reasoning that such access was essential for competing undertakings to pursue their commercial activities. In recent history, natural monopolies such as this have often been publicly-owned or regulated, however such facilities are increasingly the subject of deregulation and privatisation, in order to ‘lower prices, stimulate technological innovation and increase consumer choice’.

Although the argument for previously publicly-owned facilities being treated as ‘essential facilities’ following deregulation is reasonably uncontroversial, the case of fully privately-owned assets being treated the same way has proved more problematic.

2. Economic foundations of the EFD: the issue of efficiency

Generally, allowing private undertakings to decide with whom they trade and deal is a key ingredient of effective competition. Economic theory suggests that such behaviour may lead to efficient outcomes. However, sometimes this freedom may lead to market distortions. This is particularly true in the case of dominant undertakings with large market power, who may act with a degree of independence from the market. Undertakings with large market

335. See Bronner, Opinion of AG Jacobs (‘only in cases in which the dominant undertaking has a genuine stranglehold on the related market. That might be the case for example where duplication of the facility is impossible or extremely difficult owing to physical, geographical or legal constraints or is highly undesirable for reasons of public policy. It is not sufficient that the undertaking’s control over a facility should give it a competitive advantage.’)
337. Mair, ‘Taking Technological Infrastructure Seriously’.
339. James Turney, ‘Defining the Limits of the EU Essential Facilities Doctrine on Intellectual Property Rights: The Primacy of Securing Optimal Innovation’ (2005) 3(2) Nw J Tech & IP 179, 183 (‘... the application of the essential facilities doctrine to intellectual property rights can perhaps be justified when the research and development was publicly funded in formerly nationalized industries. In such cases an essential facilities doctrine can aid market liberalization. However, the regulator must be cautious if applying the same principles when the property right has been privately financed.’)
340. See Commission Guidance on Enforcement of Art. 82 EC, para 75 (‘[w]hen setting its enforcement priorities, the Commission starts from the position that, generally speaking, any undertaking, whether dominant or not, should have the right to choose its trading partners and to dispose freely of its property.’); Langlois, ‘Technological Standards’.
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power are not disciplined by market forces to the same extent as smaller companies, meaning that stupid, greedy or short-sighted behaviour may go unpunished by the market. By going unpunished, such behaviour may lead to economic outcomes that produce social cost or forgo substantial social benefits, such as synergies or spillovers. In the case of dominant undertakings with exclusive rights over an essential resource to downstream competition, refusing to grant access may lead to underdevelopment of the downstream market. But this may not always be the case, as the exclusivity of the resource may actually drive investment and innovation by the resource owner which would be eroded under an open access regime. From an economic standpoint, deciding whether to mandate access to a privately held resource is essentially a question of balancing various kinds of efficiencies, in particular allocative (or ‘static’ efficiency) and dynamic efficiency. The first measure relates to ‘static’ resource allocation across one time period, where ‘all available...resources are allocated to their highest valued use among all market participants’ The second measure refers to resource allocation across several periods, and focuses in particular, on optimal resource allocation for the creation of innovation. It is generally accepted that the conditions for the latter type of efficiency often result in a diminution of the competitive conditions to the detriment of static efficiency. In the area of EC merger control, the Commission has accepted a so-called ‘efficiency defence’ for the creation of large market concentrations, and this may include dynamic efficiency considerations. In EU competition law, these efficiency assessments centre on the notion of ‘consumer welfare’. The EU Commission and judicature therefore accept, in principle, that efficiencies may be ‘traded off’ against each other, provided the overall effect on consumer welfare is likely to still be positive (perhaps in the middle or long run). It is precisely this ‘trade off’ of efficiencies which provides the rationale for the de jure monopolies of IPRs:

341. Lemley, ‘The Regulatory Turn in IP’, 109-110 (‘[b]ut market decision-making is efficient largely because when stupid, greedy, or shortsighted people in the private sector make poor decisions, they are overthrown by people who make correct decisions. For private decision-making to produce efficient decisions, there must be a competitive market.”)
343. Due to the argued link between market power and R&D investment. The balance is, however, fine. ‘While concentrations present a risk to innovation, they also have the potential to increase innovative output...’ see Fackelmann, ‘Dynamic Efficiency’, 1.
344. Although these are notoriously difficult to assess, see Fackelmann, ‘Dynamic Efficiency’, 23.
345. Essentially ‘consumer welfare’ is the same as ‘consumer surplus’. However this measure is fraught with difficulty and the Commission and EU judicature are not entirely consistent in its applications. This issue will be discussed again in Part IV of this paper. See Kati J Cseres, ‘The Controversies of the Consumer Welfare Standard’ (2007) 3(2) Competition L Rev 121 (“Cseres, ‘Consumer Welfare Standard’”),124.
346. Ibid, 25.
the loss in static efficiency brought about by higher prices and reduced supply is the ‘price we pay today for tomorrow’s unrestricted innovation’.

In the context of the restriction of access to IPRs by a dominant undertaking, two questions immediately arise: first, what if the loss in static efficiency exceeds the gain in dynamic efficiency?; second, what if the firm-level incentives to innovate are outweighed by the loss in dynamic efficiency industry-wide? In the case of the first question, a well-calibrated IP system should be an answer to the underlying concern. As discussed in chapter 3 of this thesis, a core component of this calibration centres on the scope of the regulatory choice over what information subject matters fall within the IP regime compared to the public domain. If this choice is poorly made, then competition law does not have any scope for intervention since it may only question the exercise of a right, not its existence. In the case of the second question (i.e. that the exercise of the IPR reduces industry-wide dynamic efficiency), then assuming that reduced consumer welfare is the result, it would seem that there are the necessary conditions for competition law intervention. However, assessing the sufficient conditions for mandating access to a privately-owned resource is a much more difficult question. We will now examine the complexities of these efficiency ‘trade-offs’ with respect to the private property rights of IPRs in more detail, beginning with a general analysis of monopolies.

a) Monopolies: de facto and de jure

According to one influential economic school, it is the lure of monopoly status (and the monopoly rents which accompany it), which provides the vigour to drive companies to continue to invest in innovation. ‘De facto’ monopolies’ or ‘dominant’ undertakings are therefore tolerated by competition law, provided their large market power is not put towards anti-competitive, exploitative or exclusionary ends. The ambit of competition

349. As discussed further in Part II, Section B of chapter 3, determining this scope relies on an ‘infrastructural approach’ to information assets.
350. Although this is the ‘official line’ (see infra), some commentators see the Court’s scepticism about the existence of the IP right (in this case, copyright) over the TV Guide in the case of Magill as the real motivation behind the decision in that case.
351. TFEU, art 345 states that “[t]he Treaties shall in no way prejudice the rules in Member States governing the system of property ownership.” This has been interpreted by the ECJ to mean that competition law (i.e., Art 102 TFEU) can only enquire into the use of intellectual property, not its existence.) See Case 238/87 AB Volvo v. Erik Veng (UK) Ltd [1988] ECR 6211.
352. The school of ‘Schumpeterian economists’, see Michael L Katz and Howard A Shalanski “Schumpeterian” Competition and Antitrust Policy in High Tech markets’ (Fall/Winter 2005) 14(2) Competition 47. See also Langlois, ‘Technological Standards’, 21 (“...one could argue that to prohibit a firm from exploiting the benefits of a legally acquired monopoly is to discourage the very sort of briskly competitive behaviour that is fundamental to economic efficiency.”); Joseph Schumpeter, Capitalism, Socialism, and Democracy (Routledge 2003) (Schumpeter, Capitalism, Socialism and Democracy); Mair, ‘Taking Technological Infrastructure Seriously’.
353. In fact, the economic concept of a ‘monopoly’ in which one firm owns 100% of market share is extremely rare. The real subject of this section is the ‘super-dominant’ firm, or the ‘quasi-monopoly’
354. Such ‘abuses’ of market power are defined in Art 101, 102 of TFEU
law’s tolerance for monopolies may arguably stretch as far as allowing monopoly pricing, although this is widely debated within the EU. Nevertheless, dominant undertakings are charged with a ‘special responsibility not to engage in conduct that may distort competition’. This duty aims to curtail the extent to which such an undertaking may flex its considerable (and often, undisciplined) market power. The economic rationale behind this can be made clearer by considering the following sketch of the economics behind the EFD. The freedom to contract permits undertakings to choose their business partners. However, absent good economic reasons like, inter alia, capacity restraints, refusing to supply downstream undertakings would seem irrational behaviour for a monopolist since it would forgo potential monopoly rents, at least under the single monopoly profit theory of unilateral conduct, discussed in chapter 1. If the monopolist constitutes the sole upstream supplier of an input for downstream undertakings (and no other supplier is possible) then the monopolist is known as an ‘upstream bottleneck’: if it cuts off supply (or fails to supply in the first place), the secondary market is terminated. In contrast to the usual exercise of monopoly power which just sets the terms of access (e.g., monopoly pricing), this scenario entails the cutting off of access altogether. In this context, such refusal to supply can be seen as ‘an instrument to achieve another purpose’. One possible purpose could be that the monopolist wishes to leverage its upstream monopoly to the downstream secondary market to capture all the monopoly rents not just in a static sense, but also in a dynamic sense, by raising entry

355. In US antitrust law, monopoly pricing, as such, is not prohibited, see Gal, ‘Monopoly Pricing’, 5 “…the Sherman Act was early on interpreted as prohibiting only exclusionary conduct that created or maintained a monopoly, rather than the monopolistic status or its exploitation”. The EC, however, has a rule about ‘excessive pricing’ (derived in part from Art 102(a) TFEU on ‘unfair prices’), which may be interpreted as referring to monopoly pricing. It is defined as a price which has ‘no reasonable relation to economic value’ (as per General Motors v Commission (26/75) [1975] ECR 1367, para 12. However, the Commission has been a bit reticent in the application of this rule. Furthermore, in high-technology industries with large sunk R&D costs, prices will always be higher than in competitive markets (where marginal cost equals marginal revenue) because undertakings try to recoup their fixed costs). The difficulty in assessing costs in high-technology industries, and whether or not prices are consequently ‘excessive’ may also be a reason for the Commission’s reticence. See Damien Geradin, ‘The Necessary Limits To the Control of ‘Excessive Prices’ By Competition Authorities – A View From Europe’ (2007) Tilburg University Legal Studies Working Paper, 8 <http://ssrn.com/abstract=1022678> accessed 14 October 2016.


357. Under the EFD test in EU, these are labelled ‘objective justifications’.

358. This argument is known as the ‘single monopoly profit’ argument, and derives from the so-called Chicago School of Economics. See Einer Elhauge, ‘Tying, Bundled Discounts, and the Death of the Single Monopoly Profit Theory’ (2009) 123(2) Harvard L Rev 399.

359. This is the language used in the DG Competition Discussion Paper on the Application of Article 82 to Exclusionary Abuses (Brussels, December 2005).

360. On a ‘Chicago School’ reading of monopoly economics, this behaviour is still irrational since the total monopoly rents it could extract on the secondary market would be the same whether it monopolised it (and extracted them itself) or received the rents via the undertakings in that market paying monopoly prices for the input. However, it is rational behaviour if for one reason or another, the upstream firm may be unable to extract from the downstream competitors all the monopoly rents in the downstream chain in Luis M Cabral, Introduction to Industrial Organization (The MIT Press, 2000), 79. However, it is submitted that this criticism overlooks the dynamic effects of controlling a resource which extend to altering the market structure and controlling entry, rather than just the extraction of monopoly rents.
barriers for new entrants. This may negatively affect dynamic competition in two ways; first, by cutting off the stream of product variety which may derive from a competitive marketplace; second, by weakening the incumbent’s incentives to innovate by removing the ‘Schumpeterian’ dynamic constraint of firm entry. Effectively, this refusal to supply ‘allows it to affect the structural conditions it faces rather than merely allowing it to maximise a fixed pie of profit.’ In summary, by foreclosing the secondary market and thus eliminating competition, the dominant undertaking may decrease consumer welfare by, e.g., decreasing the product variety, and perhaps also its own incentives to innovate, as well as raising entry barriers for the operation of dynamic competition. Essentially, the entire downstream value chain would be jeopardised by such a refusal to supply, in the same way chapter 1 of this thesis described in relation to standards-essential patents over cooperative standards. The social cost involved in limiting or curtailing access to such assets therefore also includes the foregone social value and spillovers that could have resulted from the foregone downstream value creation. This is the economic nub of the EFD mandating access to the dominant undertaking’s assets.

Furthermore, refusal to grant access to an essential facility in high technology markets can have economic effects which are exacerbated by forces such as network effects and ‘switching costs’. As discussed in chapter 1, these demand-side effects can drive the entrenchment of small market advantages into a game of ‘winner takes all’, where leading technologies may acquire the character of ‘technological infrastructure’. The IPR ‘reading on’ to such infrastructure may then be considered essential facilities under the EFD, and as further discussed below.

361. Thus diminishing the dynamic constraint of firm entry, which can help keep the incumbent innovating.
362. Schumpeter, Capitalism, Socialism, and Democracy; Mair, ‘Taking Technological Infrastructure Seriously’.
364. This depends, inter alia, on the character of the innovation: Cabral, Industrial Organization, 298 (“[i]ncumbent firms have a greater incentive than entrants to perform R&D toward a gradual innovation. If, however, there is uncertainty regarding the threat of entry or if the innovation is sufficiently drastic, then outsiders may have a greater incentive to perform R&D than incumbents.”)
366. Mair, ‘Taking Technological Infrastructure Seriously’.
368. Ibid, 250 (“antitrust interventions must not discard beneficial synergies that require sharing”).
370. ‘Switching costs’ are the costs faced by a consumer changing from one high-tech product to another, such as e.g., having to learn how to use a new interface from scratch. Farrell and Klemperer, ‘Coordination and Lock-in’.
371. Mair, ‘Taking Technological Infrastructure Seriously’; Frischmann and Waller, ‘Revitalizing Essential Facilities’, 63 (“...the EU cases seem to instinctively understand the value of the essential facilities doctrine when applied to infrastructural assets, both physical and incorporeal”).
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b) IP as an essential facility

As will be discussed in much greater detail in chapter 3 of this thesis, IP is distinguished from traditional property in two main respects: its intangibility and its ‘public good’ character.372 These attributes make IP (or the information that IP protects) especially vulnerable to exploitation by free riders.373 In high technology industries, the costs of R&D leading to a successful innovation may be very high.374 In order for rational undertakings to attempt to innovate the rewards have to be high, and moreover, immunised from the free rider effect. This is argued to be the function of an IP regime:375 the allocative inefficiency of monopoly power is traded off against its purported positive dynamic efficiency effects.376 The argument against treating IPRs as essential facilities under the EFD thus centres on the fact that:377

...especially in high-technology markets where rewards drive innovation...[i]f those rewards are taken away, the innovation will likely decline, and in the long run consumers will suffer.

However, as shown in the above section, if this incentive system is too ‘strong’ (in the sense of providing too much protection for the monopolist/IPR-holder) it can result in sub-optimal industry-wide dynamic efficiency, undermining the raison d’etre of the right in the first place. In the relevant context of a two-market analysis in high-technology industries, this can

372. Meaning its non-rivalry and non-excludability (except by legal means), see chapter 3 of this thesis for more detail.
373. The ‘free-rider effect’ is where ‘market participants obtain the benefits of a good without contributing to its cost of production’ see Dina Kallay, supra note 47, p 13. See also the prisoner’s dilemma argument developed in Part III, Section C(2) of chapter 3 of this thesis.
374. Sidak and Lipsky, 'Essential Facilities'; Areeda, 'An Epithet'; Geradin, 'Pricing Abuses'.
375. This argument essentially takes the form of a prisoner’s dilemma argument, however chapter 3, Part III, Section C(2) also develops an ‘assurance game’ model of the purpose of IPR, as initially developed in Shubha Ghosh, ‘Patent Law and the Assurance Game: Refitting Intellectual Property in the Box of Regulation’ (2005) 18(2) Canadian JL & Juris 1315.
377. Sergio Baches Opi, ‘The Application of the Essential Facilities Doctrine to Intellectual Property Licensing in the European Union and the United States: Are Intellectual Property Rights Still Sancrosant?’ (2001) 11(2) Fordham IP, Media & Entertainment LJ 409, 470. This logic has also been echoed by Justice Scalia, as already quoted in chapter 1 of this thesis, and is re-quoted here for convenience, Verizon v Trinko, 540 U.S. 398 (2004), see Part III of the judgment (“[f]irms 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.”)
378. The operation of the EFD typically requires identification of both a primary (upstream) and secondary (downstream) market, see Commission Guidance on Enforcement of Art. 82 EC, para 76 (“typically competition problems arise when the dominant undertaking competes on the ‘downstream’ market with the buyer whom it refuses to supply. The term ‘downstream market’ is used to refer to the market for which the refused input is needed in order
be due to a couple of different but intimately related reasons as already discussed: the loss of incentives to innovate due to reduced competition or (threat of) firm entry\textsuperscript{379}, and the loss of product diversity from complementary or follow-on innovations. Consider the scenario where the upstream monopolist/IPR-holder is the only supplier of a certain industry-wide de facto technological standard. If this standard is sufficiently wide-spread and generic it could be said to have the character of ‘infrastructure’\textsuperscript{380}; a character which would be further entrenched by forces which mark high-technology products, such as network effects\textsuperscript{381} and switching costs\textsuperscript{382}. Certainly, it would function as a technological ‘bottleneck’ for the downstream undertakings. Cutting off access to this standard by exercising an IPR (or refusing to provide it in the first place) would effectively foreclose the secondary market, enabling the IPR-holder to leverage its monopoly to this market and alter the dynamic competitive conditions. This behaviour may have the effect of reducing industry-wide dynamic efficiency. As developed in the GC\textsuperscript{383} Microsoft decision (see discussion in Part III), denying access to the technological infrastructure can be described as limiting ‘technical development’ generally, by retarding follow-on innovation in markets requiring the latter as a necessary input.\textsuperscript{383} The reasoning here depends on the peculiar nature of high-technology industries, and of the software industry in particular (which demands a high degree of standardisation due to interoperability requirements). The pattern of development in these industries, rather than being a series of radical jumps in technology, has historically been one of ‘rapid sequential innovation, re-use, and re-combination of components and strong network effects that privilege interoperable components and products’\textsuperscript{384}; one where undertakings modify and improve the products of their predecessors (or competitors)\textsuperscript{385}. While some IP protection may provide the incentives to innovate in the first place, it is argued by a number of scholars\textsuperscript{386} that overly strong IP
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protection which encumbers this natural incremental process might lead to technological stagnation. Bessen and Maskin put the point this way:

A firm that patents its product in a world of sequential and complementary innovation can prevent its competitors from using the product (or sufficiently similar ideas) to develop further innovations. And because these competitors may have valuable ideas not available to the original firm about how to achieve such innovations, the patent may therefore slow down the pace of invention.

While this is essentially an argument for weaker patent rights in the software industry (in terms of ‘scope’ and perhaps raising the bar on patentability in general), it could be argued that the point gains even more force where the IP-protected product constitutes a technological infrastructure and is a ‘bottleneck’ for secondary market software developers. In this case, the dynamic efficiency concerns of the IP-protected product may be outweighed by those of the market (or industry) as a whole. This is therefore the type of case in which competition policy and, the EFD in particular, could intervene to realign the dynamic efficiency balance towards a socially optimal outcome.

c) The EFD as a special case of refusal to supply

So far this chapter has refrained from distinguishing the EFD from the general category of ‘refusal to supply’. This is because, although there exists a purported EFD line of case-law, the cases are often ‘dry and under-theorized’ and lack any detailed economic rationale behind the application of the rules. Nevertheless, some commentators claim to have discovered some plausible, if implicit, conditions for the judicature’s use of the EFD. Since this topic forms the main part of the ensuing analysis and commentary of the next part, this section attempts only a very brief preview. In essence, (and as developed and defended already in chapter 1) the EU judicature’s ‘instinctive understanding’ of an essential facility is that of a resource with ‘infrastructural’ characteristics, which supports ‘significant downstream positive externalities’, strong network effects, and has ‘natural monopoly’ attributes.

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387. Indeed the following authors argue that precisely this happened in the 1980’s after the introduction of strong patent rights in the software industry, see Bessen and Maskin, ‘Sequential Innovation’, 2.
388. Ibid, 4.
389. Ibid, 2: (“For industries like software or computers, theory suggests that imitation may promote innovation and that strong patents (long-lived patents of broad scope) might actually inhibit it.”)
391. In the near-equivalent case of the US, see Lao, ‘Terminal Railroad to Microsoft’, 558 (“though these cases are somewhat undertheorized, they are in fact based on sound, if unarticulated, principles.”)
392. Ibid, 578.
393. Ibid, 582, 595
these attributes map to the definition of ‘technological infrastructure’ developed in chapter 1 of this thesis. Part III of this chapter will attempt to unpack them from the legal reasoning used in the Microsoft case and develop the argument in greater detail in relation to de facto technological standards.

Having now assessed the key economic and legal arguments surrounding the EFD, we are in a position to analyse the Microsoft case to determine to which extent the doctrine was utilised in the Court’s reasoning.

III. THE COURT’S REASONING: TO WHAT EXTENT WAS THE EFD APPLIED?

Before we begin this analysis: first some preliminary remarks. It is important to reiterate the point that the EFD was never expressly mentioned in the Microsoft case. As explained in Part II, Section 2(b) of this chapter, that does not rule out the EFD having been applied implicitly. This section will dig into the legal and economic underpinning of the decision in Microsoft by making use of the analytical tools developed in Part II. In particular, the infrastructural approach of the EFD as proposed by Waller and Frischmann and suggested by them to be the CJEU’s ‘instinctive understanding’ of the EFD, will be a constant theme in this analysis. The commentary in the following section will again address and justify this approach, and attempt to highlight the application of the two-stage ‘infrastructural approach’ identified in chapter 1. The final part of this section will then briefly develop the same arguments in relation to the Commission’s recent investigation into Google’s Android.

A. The structure of the GC’s reasoning

The first task the Court set itself was to determine the ‘exceptional circumstances’ under which to assess whether Microsoft’s refusal to supply was an abuse under Art 102 TFEU. After having considered the array of circumstances put forward by the Commission, including some not formally recognised by the case-law, the Court settled on the frameworks established in IMS and Magill as a first course. Although some commentators consider these cases as quintessential EFD IPR cases, it is the details and character of the Court’s reasoning which will shed light on whether this was a traditional ‘refusal to supply’ analysis or application of the EFD. The elements of the IMS/Magill framework as they were used in the Court’s reasoning will now be examined.

394. Arguing that the ‘circumstances’ recognised in the case-law were not exhaustive (see para 303 of the GC Microsoft decision) the Commission proposed, inter alia, that the supply of interoperability information is a matter of particular concern to the Community since it is the subject of the Directive 91/250.

395. i.e., if these circumstances were found not to be present, then the Court would consider the other circumstances.
1. Indispensability of the interoperability information and the ‘elimination of competition’

The Court accepted the Commission’s proposed approach to assess the indispensability of the interoperability information (hereinafter the “information”) at issue, which consisted of two parts. The GC’s reasoning is structured around, first, determining what degree of interoperability is necessary in order for Microsoft’s competitors in the work-group server operating system market (“work group server OS”) to viably remain, and second, to assess if the information requested by Microsoft’s competitors (“the competitors”) and refused by Microsoft was indispensable to achieve that aim. Due to the extremely close link between the ‘indispensability’ criterion and the ‘elimination of competition’ criterion suggested by the first stage of this approach, these two elements will be considered together in what follows.

The first part of this approach involved complex technical and economic assessments that cannot be set out here. However, it is the character of the GC’s reasoning that is of interest, and this can be summarised simply. Essentially, the Court considered two possible types of interoperability between the 'Windows domain architecture' (“Windows”) and the competitors’ work group server operating systems: ‘one-way’ (when all the features of the work group server OS can be accessed from a Windows client OS), or ‘two-way’ (when in addition to the latter, non-Windows work group servers may also communicate with Windows client and server OS). The two-way type of interoperability is of a higher degree of compatibility with Windows, and would allow non-Windows work group OS to interact with the Windows 'domain architecture' on an 'equal footing' with Windows work group server OS. (One-way interoperability information was already available to competitors.) When reasoning whether one-way or two-way interoperability was necessary to maintain effective competition on the secondary market, the GC’s analysis focussed on Microsoft’s position in the upstream market of client PC OS, and the consequences of this position for competitors in the downstream market of work group server OS.

In the upstream market of client PC OS, the GC observed that Microsoft’s dominant position displayed 'extraordinary features'. In particular, Microsoft Windows had a market share of more than 90%, which functioned as a ‘quasi-standard’. Furthermore, Microsoft itself, in light of its market share, could be considered a ‘quasi-monopoly’, which had, moreover, managed to ‘impose the Windows domain architecture as the *de facto* standard for work group computing’. Since Windows was the effective ‘technological standard’ for PC client OS, it was necessary for competitors' work group OS to interact with it. However, one-
way interoperability would only allow this to occur efficiently in the case of competitors’ work group client OS. In the case of non-Windows work group OS servers interacting with Windows client OS, the lack of interoperability would cause several ‘technical glitches’ that would erode efficiency, compromise security, and diminish overall productivity\(^{401}\). This lack of ‘interoperability with the Windows domain architecture has the effect of reinforcing Microsoft’s competitive position on the work group server [OS] market\(^{402}\) by inducing consumers to buy the Windows work group OS in favour of its competitors. Under the criterion of ‘elimination of competition’ (which was loosened in this case to ‘elimination of effective competition’)\(^{403}\), the Court assessed the empirical evidence for the extent of this inducement by examining the evolution of market shares of the competitors’ vis-à-vis Microsoft in the secondary market. Microsoft was found to have undergone a ‘rapid and significant growth’\(^{404}\) in its market share by 40% over six years\(^{405}\) at the expense of its competitors, in particular, Novell\(^{406}\). Microsoft’s [then] current market share of at least 60%, coupled with its strong growth and the strong network effects present in the industry (such as the fact that ‘a very high number of technicians possess skills specific to Windows operating systems’\(^{407}\)) led the GC to conclude that the ‘refusal at issue entailed the risk of elimination of competition.’\(^{408}\) The GC thus concluded that both the first stage of the ‘indispensability’ test and the ‘elimination of competition’ criteria were fulfilled in this case. Another way of putting this point which the GC used, was to say that ‘non-Microsoft work group server OS must be capable of interoperating with the Windows domain architecture on an equal footing with Windows work group OS if they are to be marketed viably on the market’:\(^{409}\) full interoperability with Windows is indispensable for Microsoft’s work group server OS competitors to remain on the market.

The second part of the Commission’s approach for the indispensability test was given extremely limited assessment. In short, the GC concluded that since none of Microsoft’s other ‘recommendations or solutions made it possible to achieve the high degree of interoperability... required’\(^{410}\), Microsoft had not demonstrated that this standard of interoperability information was not indispensable.

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401. Ibid, para 415.
402. Ibid, para 422.
403. Ibid, para 139.
404. Ibid, para 567.
405. Ibid, para 570.
406. Ibid.
408. Ibid, para 620.
409. Ibid, para 421.
410. Ibid, para 435.
The GC thus concluded that the two-way compatibility standard was the correct degree of interoperability required to maintain effective competition on the secondary market, and its provision to Microsoft’s competitors was indispensable to achieve that aim. It is clear from the above reasoning that the Court came to this conclusion in recognition of the fact that Microsoft Windows is the ‘technological bottleneck’ through which the downstream market of non-Windows work group OS must pass. Given Windows’ status as a de facto standard for client PC OS, it would be impossible for the secondary market to remain competitively viable without full Windows interoperability.

In a real sense, then, it is not the interoperability information per se that is indispensable, it is ‘open access’ to the Windows platform that the information unlocks. To say that this access is ‘indispensable’ is tantamount to saying that the interoperability information that unlocks it is an ‘essential facility’. Microsoft Windows’ position as a de facto standard gives it several features characteristic of infrastructure as identified by Waller and Frischmann, such as: it can be consumed non-rivalrously, and ‘social demand for the resource is driven primarily by downstream productive activity that require the resource as an input’. It is submitted that both these statements are manifestly true about Microsoft Windows, the first being obvious given the public good nature of information goods, and the second shown to be true almost by the definition of the role of an operating system: it is not the OS itself that consumers demand, but the applications and programs (i.e. the downstream functionalities) that the OS permits them to use. Another way of putting this is that the Windows platform supported significant downstream positive externalities by virtue of its ‘scaffolding’ upstream role. Furthermore, the GC’s constant reference to the strong direct and indirect network effects associated with the Windows OS platform served to underscore and further entrench its infrastructural character, where Microsoft Windows’ status as ‘de facto standard’ for work group computing enabled it:

- to determine to a large extent and independently of its competitors, the set of coherent communications rules that will govern the de facto standard for interoperability in work group networks.

It is submitted that these special features of the market emphasised by the Court shows that the rationale behind the GC’s reasoning was that the Windows OS had achieved infrastructural status with regard to downstream work-group OS products. Given this finding of Windows OS as technological infrastructure, the interoperability information was found to be a sine qua non.

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412. In the sense that individuals using their own operating systems do not limit the use of the operating system by other individuals.
413. GC Judgement, para 392.
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non for effective market entry and downstream competition, making it an essential facility. As discussed in chapter 1, the above components of the EFD constitute the ‘infrastructure screening’ aspects of the two-stage infrastructure approach. By demonstrating the indispensability of the interoperability information and the fact that denial of access chokes of effective competition, the market ‘scaffolding’ role of the asset is proven to conform to technological infrastructure. However, merely identifying the interoperability information as infrastructural is not yet sufficient to warrant an open access rule. The economic consequences of compulsory licensing must still be accessed from an efficiency point of view. This is the purpose of the remaining two components of the EFD: the ‘new product test’ and objective justifications.

2. Prevention of the emergence of a ‘new product’ and lack of objective justifications

Since the interoperability information in question is most likely covered by IPRs, Microsoft’s refusal to grant a license to the competitors must be shown to have ‘prevented the development of the secondary market to the detriment of consumers’. In other words, the denial of access to the essential facility must have resulted in consumer harm. The ‘new product test’ as discussed in the context of IMS/Magill can be seen to function as a proxy for this consumer harm by standing in as a proxy also for dynamic efficiency. The ‘development’ which was prevented must moreover be shown to constitute ‘not mere duplicates...but new goods or services not offered by the owner for which there is potential consumer demand’. The Court’s interpretation of this element was one of the most controversial issues in its analysis. The focus of the criticism is on the word ‘new’, and whether the Court’s assessment of the types of non-Windows work group OS which would have resulted from access to the full interoperability information would have met this exacting standard. The fourth IMS/Magill criterion, the absence of ‘objective justifications’, will be discussed in conjunction with this element for reasons that will become clear.

The ‘new product’ test is a problematic one. As mentioned, in effect, it stands in as a ‘proxy’ balancing test for ‘weighing...the interest in protection of the intellectual property right and the economic freedom of its owner, on the one hand, and the interest in protection of

414. Ibid, para 313. It was unsure whether the information at stake was a ‘trade secret’ or an IPR, as although copyright of course applies automatically to software, not all interface information is considered copyrightable subject matter, see discussion on the 2016 Electronic Frontier Foundation, ‘Oracle v Google’ <https://www.eff.org/cases/oracle-v-google> accessed 13 October 2016.
415. IMS v NDC, para 48.
416. Ibid, para 49.
Technological Infrastructure and the EU Essential Facilities Doctrine

free competition on the other.\textsuperscript{418} If we unpack this sentence by AG Tizzano\textsuperscript{419} from IMS in terms of the economic rationales behind ‘the interest in protecting the IPR’ and ‘the interest in protecting free competition’, we arrive at a balancing act between efficiencies described in Part IV, Section B. This test might be more clearly conceptualised as a balancing act between the dynamic efficiency produced by protecting the IPR at issue and the dynamic efficiency (industry wide) produced by its compulsory licensing, in the sense of liberating it as an input to the competing undertakings downstream, if we follow AG Tizzano’s explanation of the purpose of the ‘new product’ test, we have to agree with at least one economic commentator, that it is indeed a very ‘bad proxy of the parameter the Court seeks to test’.\textsuperscript{420} An economically robust application of this test would require an accurate measure of the innovation rate in the first case as against the second case in order to see which was greater. As the present test stands it does nothing of the kind. For instance, even if a refusal to license does block a ‘new product’ for which there is potential consumer demand, it does not follow that consumers as a whole would be better off if compulsory licensing was granted: the loss of the incentive to innovate by the IPR-holder might still outweigh the potential consumer benefit gained by the ‘new product’.\textsuperscript{421} Moreover, there are difficulties surrounding the definition of ‘new’ that cause further trouble since it is ‘a continuous rather than a discrete variable’.\textsuperscript{422} There is also the fact that, as already mentioned in Part IV, section B, innovation in the software industry is characterised by rapid sequential and complementary innovation, which builds incrementally on previous innovations.

It is perhaps in awareness of the above points (or at least the untidiness of the economic reasoning) that the Court relaxes the strict interpretation of ‘new product’ and chooses to rest its analysis on whether Microsoft’s refusal to license the interoperability information limited the ‘technical development’ in the secondary market:\textsuperscript{423}

\ldots the appearance of a new product cannot be the only parameter which determines whether a refusal to licence an [IPR] is capable of causing prejudice to consumers within the meaning of Article 82(b) EC. As that provision states, such prejudice may arise where there is a limitation not only of production or markets but also of technical development.

\textsuperscript{418} AG Tizzano, IMS v NDC, para 62.
\textsuperscript{419} Ibid.
\textsuperscript{420} Francois Leveque, ‘Innovation, Leveraging and Essential Facilities’ (2005) 28(1) World Competition 76
\textsuperscript{421} This argument was in fact developed by Microsoft under the ‘objective justification’ element of the EFD, where it suggested that unless its exclusivity would be protected it would lose incentives to invest. The reply by the GC on this point (discussed below) can therefore be seen as its response to this argument as well.
\textsuperscript{422} Francois Leveque Innovation, Leveraging and Essential Facilities’ 75
\textsuperscript{423} GC Judgment para 647.
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The Court relies on the wording of Art 102 (b) TFEU to support this interpretation. On the basis of this test, the Court finds that the work group server OS that would be developed if the ‘obstacle of insufficient interoperability was removed would be differentiated from Microsoft’s product, offering innovative features which would be distinguished from those systems with respect to parameters which consumers find important. Microsoft’s refusal to licence its IP thus meant that technical development in the secondary market was impaired. The harm to consumers was characterised as the loss of the choice of these other (differentiated) non-Windows work group server OS, and also the indirect harm caused by the ‘impairment to the effective competition structure’ brought about by Microsoft’s refusal to supply the information.

Interestingly, the efficiency-balancing act which is argued to be the proper rationale behind the ‘new product test’ (the ‘economically robust’ test described in the preceding paragraphs) is identical to the disputed ‘new test’ which Counsel for Microsoft claimed the Commission illegitimately used to evaluate its ‘objective justification’ for not licensing its interoperability information:

[T]he Commission considered that a refusal to communicate information protected by [IPRs] constituted an infringement of Article 82 EC if, all things considered, the positive impact on the level of innovation in the whole industry outweighed the negative impact of the dominant undertaking’s incentives to innovate.

Since Microsoft’s objective justification for not licensing its IPR over the interoperability information was the circular reason that it would ‘eliminate incentives to invest in the creation of future intellectual property’, (i.e. the ‘interest’ the ‘new product’ test is meant to balance) the fact these two tests are analogous in this instance is not surprising. The GC

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424. Art 102(b) TFEU ("...limiting production, markets or technical development to the prejudice of consumers").
425. GC Judgment para 656.
426. Ibid, para 652.
427. Ibid, para 664.
428. Counsel for Microsoft argued that this ‘new test’ was legally defective: ("...new test, which is legally defective and marks a radical departure from the tests defined in the case-law") ibid, para 669.
429. As stated earlier in this chapter, objective justifications can function as an affirmative defence to charges of illegally refusing competitors access to essential facilities under Art 102 TFEU, see Commission Guidance on Enforcement of Art. 82 EC, para 28 ("[i]n the enforcement of Article 82, the Commission will also examine claims put forward by a dominant undertaking that its conduct is justified. A dominant undertaking may do so either by demonstrating that its conduct is objectively necessary or by demonstrating that its conduct produces substantial efficiencies which outweigh any anti-competitive effects on consumers.")
430. GC Judgment Para 669-670
431. Ibid, para 689.
stated, however, that this ‘new test’ was never applied by the Commission\textsuperscript{432}, and in any event, Microsoft’s ‘objective justification’ was rejected out of hand as being inconsistent with the ‘raison d’etre of the [IPR] exception’\textsuperscript{433} and as ‘vague and theoretical’. In conclusion, the GC found that the ‘new product’ element (albeit, somewhat revamped as ‘technical development’) was met in this case, and furthermore, there was an absence of ‘objective justification’.

It is submitted that the Court’s reasoning in the above exemplifies, as in the previous section, an application of the EFD in the form of the two-stage infrastructural approach. First, the Court screened for the infrastructural attributes of the asset, by making findings on indispensability and elimination of effective competition. Second, the Court assessed with an open access rule would in fact lead to greater industry-wide dynamic competition compared to the lose in Microsoft’s private incentives to innovate.

The Court’s relaxation of the ‘new product’ criterion has been argued by commentators\textsuperscript{434} to go against the standard IMS/Magill interpretation of the element. However, a close reading of the IMS Judgment and particularly the Opinion of AG Tizzano at least makes this point debatable.\textsuperscript{435} Whether it was or was not a novel approach, it is submitted that it was certainly a more principled approach both on economic and legal grounds. On economic grounds, ‘technical development’ is a more nuanced category that is perhaps more suited to the incremental nature of innovation in high technology industries, particularly the software industry, than the ‘radical’ innovation implied by ‘new product’ test. This is so particularly when the ‘essential input’ is a technological standard (or the ‘access key’ to such a standard like the interoperability information). Unless software companies can enter the market in the first place (at least in some form) it would be impossible to get a sense of the various niches of potential consumer demand. It is only by competition in that market, and in the struggle for market share, that undertakings can radiate out into exploring new avenues of innovative possibility. It is from this process of vigorous dynamic competition that innovation comes. ‘New products’ –in the sense of ‘radical’ innovations- would only come about after this initial exploratory phase, of which access to the ‘infrastructure’ would be the condition sine qua non. For this reason the slightly weaker ‘technical development’ test functions as a more nuanced substitute. It is the GC’s ‘instinctive understanding’ of the importance of Windows as an infrastructure for sustaining these downstream externalities that, it is submitted, represents the application of the EFD in this case as opposed to a traditional ‘refusal to supply’. Furthermore, on legal

\begin{footnotesize}
\begin{enumerate}
\item\textsuperscript{432} Ibid, para 710.
\item\textsuperscript{433} Ibid para 690.
\item\textsuperscript{434} Andreangeli, ‘Case T-201/04 Judgement’, 884.
\item\textsuperscript{435} Christian Ahlborn, David S Evans and A Jorge Padilla, ‘The Logic & Limits of the “Exceptional Circumstances Test” in Magill and IMS Health’ (2004) 28(4) Fordham Intl LJ 1109, 1120 (“[a]dvocate General Tizzano thus considered that IMS Health’s refusal to license could only be considered abusive if it prevented the emergence of “new” products or services. However, his view of what might constitute a “new product” in the downstream market could be read rather expansively, because taken literally it could include minor improvements on existing products”) (italics added).
\end{enumerate}
\end{footnotesize}
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grounds the ‘technical development’ test coupled with the ‘consumer harm’ sub-element is a better proxy to the efficiency-balancing act which underlies the ‘new product’ rule. This is because ‘technical development’ is a better description of the incremental innovation process in many high technology industries, and thus is more likely to capture the dynamic efficiency loss (industry wide) associated with the refusal to license the IPR. These arguments will be developed in greater detail in the commentary below, which will also briefly consider the recent Commission investigation into Google’s Android OS.

IV. CONCLUSION

A. Commentary

It is the contention of this chapter that the EFD was the guiding legal rule behind the GC’s decision in the Microsoft case. By unpacking the Court’s reasoning in this case, an underlying infrastructural approach to the problem of access to IP-protected essential facilities was identified and defended, leading to the open access rule of a compulsory license, or as stated in the decision: ‘[Microsoft] is required to license its ‘server/server’ communication protocols so that they can be implemented in directly competing server operating systems.’ This overall approach of ‘if infrastructure, then open access’ is consistent with the economic and legal reasoning developed in detail in chapter 1.

Reaching the above conclusion required a detailed inquiry into the economic and legal rationales underlying the purpose of the EFD, as well as the conditions under which the EU judicature has purportedly sanctioned its use in previous cases. This chapter has followed the ‘infrastructural’ approach to understanding the EFD, and views this as the ‘instinctive understanding’ of the doctrine as utilised by the CJEU. As a distinct subset of the general category of ‘refusal to supply’, the EFD concerns a resource which is characterised as supporting significant downstream positive externalities, the social value of which is more important than the resource itself; involves strong network effects; and like a ‘natural monopoly’, is for whatever reason, impossible (or economically unreasonable) to reproduce.

The interoperability information enabling non-Windows work group server OS to be fully compatible with the Windows domain architecture met all the above criteria. However, it is important to note that the interoperability information merely functioned as the ‘access key’ to unlock full Windows compatibility, and that it was Windows OS itself which was the true technological infrastructure in this case. Since Windows had become the de facto ‘quasi standard’ PC client OS, it functioned as the ‘technological bottleneck’ through which all the derivative markets, products, and thus positive externalities, flowed. In many important ways,

436. GC Judgment Para 673.
by achieving the status of technological infrastructure, Windows had become a privately-owned standard with a public-utility character. It is submitted that the bulk of antitrust concerns which involved Microsoft centred on this tension between its simultaneous public/private character, and the risk that the panoply of ancillary markets may ‘inexorably move towards a “homogenous” Microsoft solution’. This seems to be true, certainly, of the derivative markets involving Internet search engines, Media playing software, and the present case of work group server operating systems. Not all these cases involve the EFD, but the infrastructural nature of the Windows operating system is a central issue of each of them.

The question, put in its most extreme form, is essentially to what extent can the private owner of a technological infrastructure use its formidable market power to determine the character of the derivative markets by favouring its own products at the expense of competitors, or by other means. EU competition law’s answer is centred on the notion of ‘consumer harm’; however, a purely economic approach might favour a dynamic efficiency appraisal. One important and difficult question is whether these two measures are analogous, or more interestingly, whether they can be reconciled. According to one commentator, ‘it is generally accepted that a business conduct which makes consumers worse off in terms of price, output and quality makes the competitive process worse off and attracts competition law liability.’ However, the measures of ‘price’, ‘output’ and ‘quality’ are ‘static’ efficiency measures that lack the dynamic element. A strict enforcement of such a standard would always attach more importance to consumers’ short-term gains as opposed to tolerating some losses for the sake of innovation increases. However since dynamic efficiency gains are effectively second-period allocative efficiency gains resulting from first-period innovations, taking a middle or long-term view of consumer welfare might be more appropriate. By focussing on ‘product variety’ in this case and the concept of consumer ‘choice’ as a contributor to consumer welfare, the GC has attempted to incorporate some of these dynamic elements into its assessment of consumer harm. This ‘speculative’ or ‘hypothetical’ notion of harm, though criticised by commentators, is submitted to be the best approximation of the true economic efficiencies at stake due to the counterfactual nature of lost innovation. The ‘technical development’ criterion used by the Court serves to identify and specify precisely what this ‘loss’ is in terms of an actual product or products. However, as these elements stand together, they fail to adequately take into account the loss of incentives to innovate by the IPR-holder, since the test only looks at whether the

439. Such as were considered in the ‘tying’ elements of this case, not dealt with in the present chapter.
441. See the discussion of counterfactuals discussed in Part III, Sections A-C.
refusal to licence prevents technical development.\textsuperscript{442} As in the scenario of a ‘new product’, it could well be the case that the dynamic efficiency gains of this ‘technical development’ are less overall than the loss in incentives to innovate brought about by compulsory licensing of the IPR, such that on balance, consumers are not harmed by the refusal to licence. Indeed, the Court did consider this side of the equation under the ‘objective justification’ criterion, but its analysis was supplementary, and explicitly not part of any ‘new’ test.\textsuperscript{443} It is submitted that if consumer harm is to be given the detailed assessment it requires, just such a balancing act should be incorporated into this legal rule, either under the ‘technical development’ element (as implied by AG Tizzano), or under the assessment of consumer harm itself.

The recent EU Commission investigation into Alphabet Inc’s abuse of dominant position with respect to Google’s Android Mobile OS provides an opportunity to test some of the economic and legal arguments first raised by Microsoft.

\section*{B. EU Commission’s Investigation into the Android mobile OS}

When Google purchased Android OS in 2005, the smartphone market was still underdeveloped. Apple’s iPhone release was still 2 years off (2007), and the dominant devices were running highly impoverished operating systems such as Symbian and Blackberry OS. Eleven years later, Android now makes up more than 80% of smart device OS’s in the EU, with Apple trailing far behind.\textsuperscript{444}

In the Commission’s Statement of Objections\textsuperscript{445}, Google has been charged with, inter alia, ‘tying’ the supply of its OS with the mandatory pre-installation of certain key software applications, such as Google Search and Google Chrome, as well as preventing customers from ‘forking’ (developing competing Android-based OS’s). In the case of Microsoft case, such mandatory tying was considered anticompetitive due to the chilling effects on the downstream application market.\textsuperscript{446} However, Android is distinguished from Microsoft’s Windows by its unique ‘open source’ status.

One fascinating wrinkle in the Google Android investigation is that Android, unlike Microsoft, is ‘open source software’.\textsuperscript{447} What this means is that device makers have the

\textsuperscript{442}. Lao, ‘Terminal Railroad to Microsoft’.

\textsuperscript{443}. GC Judgment, para 710.


\textsuperscript{446}. This ‘tying’ component of the Microsoft decision was not considered in this chapter, since it falls outside the legal rule of the EFD and is a separate legal basis.

\textsuperscript{447}. For a detailed discussion of the special attributes of open source software, see chapter 4 of this thesis.
theoretical ability to create their own Android-based OS’s independent of the version offered by Google (referred to as ‘forking’). Such a possibility would have the effect of neutralising any real dominance that Google has in the mobile OS market, and considerably weaken Google’s alleged ‘tying’ strategy as well as its ability to engage in ‘self-preferencing’ behaviour.\textsuperscript{448}

However, the Commission’s ‘Statement of Objections’ claims that Google has prevented its customers from forking Android, by use of an ‘Anti-fragmentation Agreement’. Although presented as a means of maintaining interoperability and cohesion in the Android ecosystem, the Commission views this Agreement as an illegitimate restriction of competition under as it prevents the emergence of competing Android-based mobile OS’s.

Despite the meagre details provided by the Commission’s Factsheet\textsuperscript{449}, the legal argument against Google will almost certainly be based upon ‘abuse of dominant position’ under Art 102 TFEU. Unlike the still on-going Google online search case, which seems to be formulated in terms of ‘self-preferencing’, the Android case presents facts much closer to the Microsoft case.

As with the Microsoft case, it is possible to develop the argument that super-dominant software platforms (such as Android) play an analogous economic role to ‘infrastructure’, by serving as conduits for downstream value creation. As with traditional infrastructure, there are compelling legal and economic reasons for these platforms or ‘technological infrastructures’ to operate under ‘open access’ rules. Such rules would mean that all downstream companies (including the infrastructure owner) are given equivalent access terms to the upstream platform, unless there are very good (and objective) reasons not to. As stated in chapter 2, an open access regime does not imply that resource owners cannot charge for access. The essential component of an open access rule is that the licensing terms guarantee the public availability of the resource in order to sustain ‘effective competition’.

The strength of Google’s legal arguments against the abuse of dominance charges under Art 102 TFEU will likely depend upon how well it can formulate its reasons not to operate under an open access rule. Certainly, its first response will be to dispute its dominant position, given the dynamic constraint of Apple’s iOS as well the open source nature of Android. It may also make the affirmative defence that its control over forking and App pre-installations (to prevent ‘fragmentation’ across the Android ‘ecosystem’) is ultimately in the consumers’

\textsuperscript{448} See the discussions of this type of behaviour as having EU antitrust (or not) dimensions under Art 102 TFEU with respect to a separate Google investigation related to its advertising practices in Vesterdorf, ‘Theories of Self-Preferencing and Duty to Deal’; Petit, ‘Theories of Self-Preferencing Under Article 102 TFEU’.

interests. This last point (depending as it does on Android’s open source status) would also help to distinguish the case from the otherwise very similar facts of Microsoft.

As open source software continues to deepen its role in today’s high-technology markets, this case will no doubt have resounding consequences throughout the industry. One possible outcome would be to weaken Google’s hold over its flagship Android mobile OS, and pave the way for a flood of competing Androids forked by both downstream (and perhaps) upstream device makers and software companies. Whether this serves to sharpen the Google product (by competition) or simply create interoperability problems (by fragmentation) will be keenly observed by both legal scholars and technologists. However, the legal and economic rules established in the Microsoft case will likely play a determinative role in this case.

C. Overall conclusion

In conclusion, this chapter has argued that the EFD played a significant role in shaping the GC’s decision in this case, albeit using a slightly modified IMS/Magill framework, utilizing the underlying two-stage ‘infrastructural approach’ outlined in chapter 1. We have shown that the renovation of the ‘new product’ element made by the Court is a development in the sensitivity of this test particularly suited to high technology industries, and software in particular, and moreover is justified on both economic and legal grounds. The Court’s ‘infrastructural’ approach to Microsoft’s refusal to supply helped to signal that we were dealing with the application of the EFD as opposed to a traditional refusal to supply analysis. This chapter has also identified some remaining problems with the legal rule underlying the EFD, and has made some suggestions which might help ground the doctrine on a firmer economic rationale for future cases, such as the recent (currently) on-going investigation into Google’s Android mobile OS, in which the Microsoft case will no doubt play a pivotal role.