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The Evolution of the Law and Policy on Tying: A European Perspective from Classic Leveraging to the Challenges of Online Platforms

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THE EVOLUTION OF THE LAW AND POLICY ON TYING: A EUROPEAN PERSPECTIVE FROM CLASSIC LEVERAGING TO THE CHALLENGES OF ONLINE PLATFORMS

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ABSTRACT

The abuse of market power by dominant firms continues to be one of the most controversial areas of EU competition law and tying is perhaps the most complex and intractable abuse. The

European Commission investigation into suspected infringements of EU competition law by Google in relation to alleged tying practices concerning the Android open source operating system brings once again this abuse into sharp focus. In the *Android* case, the European Commission has a unique opportunity to clarify the test for tying. The EU case law is still, formally, adhering to a pre-Chicago understanding of tying, resting on the simplistic idea that an undertaking dominant in market A can exclude competitors in market B if it forces customers buying A to also buy B. The weakness of this framework is that it lacks a robust assessment of the anti-competitive effects of tying and a realistic approach to the legitimate objectives that tying may pursue. This article demonstrates that the practice of the European Commission has moved on from such an approach, and that even the EU Courts have never rejected a more sophisticated analysis of tying. Contrary to what the vast majority of commentators believe, in the assessment of tying under EU competition law, the European Commission has systematically taken into account the structural features of the tied market that make anti-competitive tying plausible, and has carried out a thorough analysis of the anti-competitive effects of tying, which is two-fold: (1) first, tying must be likely to exclude equally efficient competitors from the tied market and, (2) second, it must be likely to lead to the acquisition, maintenance, or strengthening of market power on an affected market (the tying market, the tied market, or a related market). Finally, dominant undertakings are always permitted to plead in their defence that tying pursues a legitimate objective, is suitable to achieving such an objective, is the least restrictive way of doing so, and that the pro-competitive effects of tying outweigh its anti-competitive effects. Provided that the dominant undertaking adduces sufficient evidence to substantiate its defence, it is for the competition authority or claimant to prove that the tying under review is, on balance, anti-competitive. This analysis is fully consistent with the post-Chicago economic theories of tying and with the case law of the EU Courts on tying and on exclusionary abuses more generally.

I. INTRODUCTION

Tying occurs when two products, A and B, are marketed so that customers buying A, the tying product, must also buy B, the tied product. B, however, can also be purchased as a stand-alone

product.[1] Pure bundling occurs when two products are only sold jointly in fixed proportions.[2] Because pure bundling is a form of reciprocal tying, in that neither product is available alone, so that each is tied to the other, the assessment of pure bundling is not materially different to the assessment of tying.[3]

The assessment of tying under Article 102 has given rise to a significant degree of uncertainty and controversy.[4] On the one hand, there is a perception that the EU Courts apply a rule of *per se* illegality to tying[5] that is wholly inappropriate.[6] On the other hand, some argue that the current approach of the EU Courts, far from being a form of *per se* illegality, is a balanced test that leads to reasonable results.[7]

The Google *Android* investigation has reopened the contentious issue of when tying should be deemed anti-competitive and, therefore, prohibited by the antitrust laws. On 20 April 2016, the

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1. Communication from the Commission — Guidance on the Commission's Enforcement Priorities in Applying Article 82 of the EC Treaty to Abusive Exclusionary Conduct by Dominant Undertakings, 2009 O.J. (C 45) 7, 15 [hereinafter Comm'n Guidance on Art. 102] (formerly Article 82 of the Treaty Establishing the European Community, but now referred to as Article 102 of the Treaty on the Functioning of the European Union).

2. *Id.*

3. Mixed bundling, on the other hand, occurs when "the products are also made available separately, but the sum of the prices when sold separately is higher than the bundled price." *Id.* The effect of mixed bundling can, therefore, be the same as that of tying or pure bundling. Its assessment, however, requires an analysis of the pricing schedule of the dominant undertaking. The test for abusive mixed bundling is different from the test for abusive tying and will not be discussed further in this paper.

4. *See* JURIAN LANGER, TYING AND BUNDLING AS A LEVERAGING CONCERN UNDER EC COMPETITION LAW (2007); RENATO NAZZINI, THE FOUNDATIONS OF EUROPEAN UNION COMPETITION LAW: THE OBJECTIVE AND PRINCIPLES OF ARTICLE 102, at 211–17 (2011); EKATERINA ROUSSEVA, RETHINKING EXCLUSIONARY ABUSES IN EU COMPETITION LAW 219–57, 396–403 (1st ed. 2010); Miguel de la Mano, Hans Zenger & Renato Nazzini, *Article 102*, *in* THE EU LAW OF COMPETITION 368, 368–373 (Jonathan Faull & Ali Nikpay eds., 3d ed. 2014); J.-Y. Art & G.S. McCurdy, *The European Commission's Media Player Remedy in its Microsoft Decision: Compulsory Code Removal Despite the Absence of Tying or Foreclosure*, 25 EUR. COMPETITION L. REV. 694 (2004); F. Enrique González Díaz & Antón Leis García, *Tying and Bundling Under EU Competition Law: Future Prospects*, 3 COMPETITION L. INT'L 13 (2007); Maurits Dolmans & Thomas Graf, *Analysis of Tying Under Article 82 EC: The European Commission's Microsoft Decision in Perspective*, 27 WORLD COMPETITION 225 (2004); Kai-Uwe Kühn et al., *Economic Theories of Bundling and Their Policy Implications in Abuse Cases: An Assessment in Light of the Microsoft Case*, 1 EUR. COMPETITION J. 85 (2005); D. Ridyard, *Tying and Bundling – Cause For Complaint?*, 26 EUR. COMPETITION L. REV. 316 (2005); Hedvig K.S. Schmidt, *The Influence of IP Rights on Product Definition in Competition Law: The Curious Case of Tying*, 21 INT'L COMPANY & COM. L. REV. 224 (2010).

5. *See* David S. Evans et al., *A Pragmatic Approach to Identifying and Analysing Legitimate Tying Cases*, *in* EUROPEAN COMPETITION LAW ANNUAL 2003: WHAT IS AN ABUSE OF A DOMINANT POSITION 556, 558 (Claus Dieter Ehlermann & Isabela Atanasiu eds., 2006).

6. *See* Christian Ahlborn et al., *The Antitrust Economics of Tying: A Farewell to* Per Se *Illegality*, 49 ANTITRUST BULL. 287, 289–290 (2004); Fred S. McChesney, *One Piece at a Time: Successive Monopoly and Tying in Antitrust*, 11 J. COMPETITION L. & ECON. 1013, 1026–1032 (2015); David S. Evans, *The Antitrust Analysis of Rules and Standard for Software Platforms* (Coase-Sandor Inst. for Law & Econ., Working Paper No. 708, 2014) [hereinafter Evans, *The Antitrust Analysis*].

7. *See e.g.*, Dolmans & Graf, *supra* note 4, at 226–38, 242–44.

Commission sent a statement of objections to Google Inc. and its parent company Alphabet Inc. (together, "Google") in its investigation of practices concerning applications ("apps") pre-installed on smartphones and other mobile devices that use the Android mobile operating system ("Android").[8] The Commission's objections concerned three practices that are suspected of constituting an abuse of a dominant position by Google. Firstly, it is alleged that Google requires original equipment manufacturers ("OEMs") to pre-install Google Search (Google's proprietary search app) and Google's Chrome browser ("Google Chrome") and requires them to set Google Search as default search service on their devices, as a condition to license certain Google proprietary apps, in particular Play Store (Google's proprietary app store for Android) and Google Search. Secondly, it is alleged that Google requires OEMs to enter into anti-fragmentation agreements ("AFAs") that oblige them not to sell smart mobile devices running on versions of Android that do not comply with minimum compatibility standards (so-called "Android forks")[9] as a condition for granting a licence to Google's mobile application suite ("GMS"). Thirdly, Google is accused of giving financial incentives to manufacturers and mobile network operators on condition that they exclusively pre-install Google Search on their devices. This third allegation appears to relate to a form of exclusivity and will not be discussed further in this article. The first and the second allegations appear to relate to a form of tying. Essentially, the Commission's objections are that Google ties Google Search and Google Chrome with Play Store, and ties Play Store or Google Search with versions of Android that meet certain given requirements. The third allegation is *sui generis*. Google is not alleged to tie Play Store or Google Search with its own version of Android, but to prevent OEMs who wish to pre-install Play Store or Google Search to use non-compatible versions of Android. But it appears that the compatible version of Android that OEMs are allowed to use does not need to be Google's own version. If this were the case, then the tied product would not need to be obtained from the allegedly dominant undertaking.[10] It may be debatable,

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8. European Commission Press Release IP/16/1492, Antitrust: Commission Sends Statement of Objections to Google on Android Operating System and Applications (Apr. 20, 2016).

9. There is, of course, no legal definition of "Android fork". In the AFA, Google requires OEMs not to sell devices running incompatible versions of Android or versions of Android that do not pass certain compatibility tests. In this article, the phrase "Android fork" will be used with this meaning.

10. It may be that alternative versions of Android that OEMs entering into an AFA with Google are not forbidden from using because they do comply with the AFA minimum

therefore, whether this is a tying arrangement in the first place. Under EU law, this is, to a large extent, a matter of semantics. Conduct may be abusive under Article 102 whether or not it falls under any established category of abuse.[11] Furthermore, tying is generally considered abusive under Article 102(d). Article 102(d) prohibits "making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts."[12] There is no requirement that the 'supplementary obligations' must be obligations to purchase goods or services from the dominant undertaking itself. Thirdly, the theory of harm that would apply to this alleged abuse is similar to that which would apply to tying. By tying Play Store with Google Search or Google Chrome—the argument would run—Google would foreclose competing providers of general online search services. By requiring OEMs wishing to take a licence of GMS, and, particularly, Play Store, not to use Android forks, Google would be foreclosing providers of such incompatible versions of Android, which could be a gateway for competitors in general online searches. Both theories of harm allege that the ability to exclude rests on the dominant position in market A, which is used to impose obligations in market B in order to foreclose such a market with the aim of preserving market power in market C. Therefore, the abuse concerning foreclosure of Android fork may be assessed under the same framework of tying.

Google contests the allegations vigorously, maintaining that: (a) OEMs and carriers are not contractually obliged to pre-install any Google's apps on their devices; (b) OEMs and carriers are allowed to pre-install competitors' apps on their devices; (c) consumers are allowed to download competitors' apps on their devices; (d) fragmentation of Android would harm developers and consumers by reducing the choice of apps compatible with any Android device, or increasing their cost so that the agreements whereby manufacturers undertake to ensure minimum compatibility standards for Android are beneficial, not detrimental, to competition.[13]

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requirements include, for example, MIUI, Baidu Yi, and Oxygen OS. Whether this is actually true as a matter of fact may well be one of the issues in the ongoing investigation.

11. *See* Case 6/72, Europemballage Corp. v. Comm'n, 1973 E.C.R. 217; Case C-333/94, Tetra Pak Int'l S.A. v. Comm'n, 1996 E.C.R. I-5987; Case C-95/04, British Airways v. Comm'n, 2007 E.C.R. I-2373.

12. Consolidated Version of the Treaty on the Functioning of the European Union art. 102(d), Oct. 26, 2012, 2012 O.J. (C 326) [hereinafter TFEU].

13. Kent Walker, *Android: Choice at Every Turn*, GOOGLE: THE KEYWORD (Nov. 10, 2016), https://blog.google/topics/google-europe/android-choice-competition-response-europe.

This article aims at addressing the question of the test for anti-competitive tying from both a normative and legal perspective. It begins by discussing the Chicago critique of tying and the principles that can be distilled from the post-Chicago literature. It then examines the development of the tying test in EU law and how the test should be applied in the current *Android* investigation. Finally, conclusions are drawn.

II. THE CHICAGO CRITIQUE

Perhaps the most intuitive theory of harm of tying practices is leveraging. A monopolist in market A has the ability and the incentive to obtain a monopoly in a competitive market B if it makes the purchase of product A conditional on also purchasing product B. In this way, the monopolist will earn a monopoly profit in market A and a monopoly profit in market B, instead of a monopoly profit in market A and no economic profit in market B. The Chicago critique easily demolished this simplistic theory of harm. It showed persuasively that a monopolist in market A has no incentive to monopolise a competitive market B because it can never extract more than the value $V_a + V_b$ that consumers place on A + B. Any bundled price exceeding $V_a + V_b$ would result in no sales. Any increase in the price of B would result in lower sales of A, unless the monopolist also lowered the price of A. A producer of A and B that has a monopoly on market A, can only extract one monopoly profit on markets A and B.[14] This became known as the single monopoly profit theorem. Its policy implication was that, because the monopolist of the tying product has no incentive to tie in order to obtain monopoly power on the tied market, if tying takes place, it must have an efficiency rationale. Efficiency justifications for tying are numerous and depend on the nature of the products concerned and the features of the markets, but the Chicago School identified, in particular, efficient price discrimination through the use of tying as a metering device,[15] the

14. *See* ROBERT H. BORK, THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF 372 (1993); RICHARD A. POSNER, ANTITRUST LAW: AN ECONOMIC PERSPECTIVE 198–99 (2d ed. 2001); Guy Sagi, *A Comprehensive Economic and Legal Analysis of Tying Arrangements*, 38 SEATTLE U. L. REV. 1, 4–5 (2014); George J. Stigler, *United States v. Loew's Inc.: A Note on Block-Booking*, 1963 SUP. CT. REV. 152, 152 (1963).

15. *See* BORK, *supra* note 13, at 372; POSNER, *supra* note 13, at 199–200. Bork also identifies cases in which tying as a metering device is not a means to price discriminate, for instance when a durable product is sold that also requires maintenance services and the tying of the product with components sold in variable quantities helps the seller distinguish between heavy users who will need more costly maintenance services and light users who will have lower maintenance requirements. BORK, *supra* note 13, at 378. In this example, the tying is a means for charging different prices for the maintenance services of heavy and light users, but the different prices are cost-justified and, therefore, not discriminatory.

protection of the monopolist's goodwill by excluding inferior products from the tied markets,[16] technological interdependence,[17] economies of scale or scope,[18] and, interestingly, the evasion of price regulation.[19]

The Chicago critique of tying holds true in simple settings in which the tying and tied products are bought in fixed proportions and the tied market is perfectly competitive, particularly because there are no economies of scale or network effects. In fact, Posner himself accepts that tying may be effective in delaying the erosion of monopoly power on the tying market if there are economies of scale or network effects[20] on the tied market. The tying may force a new entrant to enter both markets. At the same time, due to scale economies or network effects on the tied market, the costs incurred on the latter market may be higher than those of the incumbent, thus deterring efficient entry.[21] This is a telling concession by Posner, who is considered one of the most influential proponents of the Chicagoan non-interventionist agenda. Furthermore, the Chicago critique, and its powerful rendition in the American legal literature in the 1970s, must be placed in context. A number of the leading tying cases were not antitrust cases at all, but patent misuse cases. They did not address competition concerns, but dealt with the boundaries between the legitimate use of a patent and its abuse.[22] Other cases were brought under Section 1 of the Sherman

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Whether, in this example, the seller could simply charge different prices for maintenance services and why it needs to tie the durable product and the components is another matter. In EU law, if the tying arrangement is exclusionary, the question will probably fall under objective justification and proportionality. *See infra* Section V.

16. BORK, *supra* note 13, at 379–80; POSNER, *supra* note 13, at 201–02.

17. BORK, *supra* note 13, at 379–80.

18. *Id.* at 378–79. While Bork talks about economies of scale, the lower costs result from the production or distribution of distinct components as a bundle, which suggests that the correct terminology should be economies of scope.

19. *Id.* at 376. The author argues that if the price of the tying product is regulated or cartelized, the tying may have the effect of remedying the distortion. The benefits of tying in case of a cartelized tying product are obvious. As for the case of evasion of Government regulation, Bork argues that the remedy does not lie in the antitrust laws. *Id.* at 381. Interestingly, the Commission now sees evasion of price regulation in the tying market as an anti-competitive effect of tying. Comm'n Guidance on Art. 102, *supra* note 1, at 16 ("If the prices the dominant undertaking can charge in the tying market are regulated, tying may allow the dominant undertaking to raise prices in the tied market in order to compensate for the loss of revenue caused by the regulation in the tying market.").

20. For a classic analysis of network effects in two-sided markets, see Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-Sided Markets*, 1 J. EUR. ECON. ASS'N 990, 990–1029 (2003).

21. POSNER, *supra* note 13, at 254–55.

22. In *Sidney Henry v. A.B. Dick Co.*, 224 U.S. 1 (1912), the plaintiff licensed a rotary mimeograph machine on the condition that only ink purchased from the plaintiff could be used. The defendant sold ink to the licensees and the complainant obtained a decree for an account of profits and damages and for an injunction against them. The question for the Supreme Court was whether the licence condition was a legitimate restriction under the patent laws of the United States. The majority of the Court held that it was. Chief Justice

Act, where there was no requirement to prove monopoly power on any market.[23] Nor can it be denied that some U.S. cases at the time adopted a simplistic, 'common-sense' approach to leveraging, which was not difficult for the Chicago School scholars to demolish, sometimes with overt sarcasm.[24] Since then, however, both the law and the economic understanding of tying have developed significantly, and it would be simply impossible today to accept the policy implications of the Chicago critique and the non-interventionist recommendations of its proponents.

III. POST-CHICAGO THEORIES OF HARM

A. Classic Leveraging Revisited

More recently, economic literature has shown that an undertaking may have the ability and the incentive to leverage its market power from the tying to the tied market.[25] The Chicago critique assumed that the tied market was perfectly competitive and with constant returns to scale. But as soon as these assumptions are relaxed, leveraging becomes a possible, if not plausible, anti-competitive strategy.[26] A monopolist on the tying market would have the ability to exclude rivals on the tied market, as tying can deprive competitors on the tied market of the benefits

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White, with whom Justices Hughes and Lamar concurred, dissented and held that the contract in question allowed the patentee to extend the patent to products that were not within its scope. In *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917), Justice Holmes dissenting, overruled *Sidney Henry,* and held that a patent did not confer upon the patentee the right to restrict or regulate the use of other products with the patented product. The Court addressed the issue as one of statutory construction and did not discuss in any detail either market power or anti-competitive effects, although it did say that that to limit the components with which a patented product can be used would be to create a monopoly in the component market, which the statute did not authorise.

23. *Int'l Salt Co. v. United States*, 332 U.S. 392 (1947) was a case brought under the Sherman Anti-Trust Act, 15 U.S.C. § 1 (2004) and the Clayton Anti-Trust Act, 15 U.S.C. § 14 (1914). Justices Frankfurter, Reed, and Burton dissenting in part (limited to the issue of the remedy), held that it was a *per se* violation of the antitrust laws for a manufacturer of salt-dispensing machines to require the lessees of the machines to purchase all their salt requirements from the machine manufacturer itself. The Court said that: "The volume of business affected by these contracts cannot be said to be insignificant or insubstantial and the tendency of the arrangement to accomplishment of monopoly seems obvious. Under the law, agreements are forbidden which 'tend to create a monopoly,' and it is immaterial that the tendency is a creeping one rather than one that proceeds at full gallop; nor does the law await arrival at the goal before condemning the direction of the movement." *Id.* at 396.

24. *See* BORK, *supra* note 13, at 366–81.

25. *See, e.g.,* Michael D. Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837 (1990); Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, 33 RAND J. ECON. 194 (2002); Jay Pil Choi & Christodoulos Stefanadis, *Tying, Investment, and the Dynamic Leverage Theory*, 32 RAND J. ECON. 52 (2001).

26. Barak D. Richman & Steven W. Usselman, *Elhauge on Tying: Vindicated by History*, 49 TULSA L. REV. 689, 689–711 (2014).

of scale economies to the point at which they exit or are marginalised. It also has the incentive to exclude because tying can be profitable each time not all products on the tied market are used as complements to the dominant undertaking's products. If this is the case, the dominant undertaking will continue to earn one monopoly profit for sales of tied products complementary to its own tying products, but will earn additional supra-competitive profits on sales of tied products not used with its own tying products. The assumptions, on which this theory rests, far from being unrealistic or confined to exceptional sets of circumstances, are probably quite general. Scale economies are a common occurrence in many markets. And in abuse of dominance cases, the dominant undertaking is hardly ever a monopolist on the tying market. As a consequence, there are generally products on the tied market that are used in conjunction with competitors' products on the tying market.

Game theoretic models have been elaborated to prove these insights. As early as 1990, Whinston examined the use of tying to foreclose the tied market.[27] He studied the case of independent, i.e. non-complementary, products, assuming economies of scale on the tied market.[28] If the dominant undertaking did not commit to tying, the tying and the independent pricing games yielded economically equivalent sub-game perfect equilibrium outcomes. Therefore, the decisions of the undertakings as to whether to be active in the tied market were also equivalent. Exclusion was not possible.[29] Intuitively, the reason is that, absent commitment, the dominant undertaking has an incentive to charge the short-term profit-maximising price for the bundle. With or without tying, the incumbent will charge the same price and make the same profit. The Chicago critique applies. If, however, commitment is possible, tying may exclude an equally efficient competitor.[30] If the dominant undertaking has irreversibly committed to tying, it will have an incentive to lower the price of the bundle below the independent pricing level. This may force the entrant to exit or reduce its output.[31] Whinston extended the model to the case of heterogeneous valuations for the tying product and found that exclusion was more plausible in the absence of commitment than with commitment. The reason was that a commitment to tying could backfire in this scenario if a sufficient number of consumers had a valuation for the tying product below the cost of production.

27. *See* Whinston, *supra* note 25.
28. *Id.* at 842.
29. *Id.* at 842–43.
30. *Id.* at 843–46.
31. *Id.* at 844.

Furthermore, with tying, the tied market becomes differentiated, with a bundle supplied by the incumbent and a standalone product supplied by the entrant. Product differentiation increases the profits of the entrant.[32] In this setting, however, exclusion becomes plausible in the absence of commitment because it allows the incumbent to price discriminate between high and low valuation consumers of the tying product.[33] Finally, Whinston studied the model in a case of complementary products, where the Chicago critique applied with more force because a higher price for the tied product has the effect of eroding monopoly profits on the tying market. In these circumstances, the incentive to tie resulted from the existence of competitively supplied alternatives to the dominant supplier of the tying product or further uses of the tied product.[34]

B. Protection of Monopoly Profits in the Tying Market

Tying may also be successfully deployed to exclude rivals from the tying market. Exclusion from the tying market presupposes exclusion from the tied market, but, in this model, exclusion from the tied market in itself would not be profitable for the incumbent. Exclusion is possible if there is a cost of entry to the tying market and either there is a cost of entry to the tied market or the tied market is characterised by network externalities.[35] Consumers have a higher valuation for the version of the tied product supplied by the rival, or the rival's marginal cost is lower than the incumbent's.[36] In a two-period game, it is assumed that in the first period the rival can only enter the tied market. In the second period, the rival decides whether or not to enter the tying market and, if the rival had not done so in the first period, the tied market. This assumption is realistic, as in many commercial contexts entry takes place at stages for the simple reason that entering more markets at once is costlier, either because of increased entry costs or higher risks, which increase the cost of capital. In this scenario, the incumbent has the ability and the incentive to tie, in order to exclude the rival from the tied market. While this action reduces the incumbent's profitability in the first period for the same reasons that underpin the Chicago critique, the rival does not enter the tied and the tying market in the second

32. *Id.* at 846–47.
33. *Id.* at 848–50.
34. *Id.* at 850–56.
35. *See* Carlton & Waldman, *supra* note 25, at 195–96, 198; Evans, *supra* note 6, at 9–28; Sagi, *supra* note 14, at 5–6.
36. Carlton & Waldman, *supra* note 25, at 196–97.

period, and the overall monopoly profits are greater than if entry had occurred.[37] The same logic applies when there is no entry cost to the tied market, but the tied market is characterised by network effects.[38]

C. Pre-Emption of Emerging Markets

Tying may be used by an incumbent to pre-empt competition in emerging markets. In this setting, there are three markets: the tying market A, the tied market B, and an emerging market C. Market C may be a complement of B or a superior substitute for the A-B system. Under certain circumstances, a monopolist supplier of A can lower the profitability of a rival entering market C by tying A and B. Carlton and Waldman study two models. In the first model, product C is associated with the complementary product B. In the second model, product C is a lower cost substitute for the A-B system. In both cases, the incumbent supplier of A and B has the ability and incentive to tie the two established products in order to deter entry in market B and monopolize market C. In the absence of the tie, entry would occur, and market C would be monopolized by the entrant.[39] While the short-term effect of these practices on social welfare is unclear because entry could be inefficient,[40] the significance of these models lies in the implications for long-term dynamic efficiency. If incumbents are allowed to exclude equally efficient rival and entrench monopolies of obsolete products, the very nature of the competitive process is undermined. Undertakings gain a competitive advantage through incumbency and not by competing on the merits. Long-term social welfare and productivity are likely to be harmed as a result.

D. Tying and Incentives to Innovate

Intuitively, in R & D-intensive industries, it is more difficult to challenge an entrenched position in a number of related markets than it is to challenge a monopoly in a single market. It is possible to formalize this intuition in models where the incumbent has a monopoly in two complementary products, that is, the incumbent is a monopolist on both the tying and the tied market. If the level of R & D expenditure is significant and the investment is risky, the

37. *Id.* at 200–05.
38. *Id.* at 205–09.
39. *Id.* at 212–16.
40. *Id.* at 213–16. *See also* Benjamin Edelman, *Does Google Leverage Market Power Through Tying and Bundling?*, 11 J. COMPETITION L. & ECON. 365 (2015).

incumbent has the incentive to tie the two products in order to make successful entry in one market conditional upon successful entry in the other market. This strategy increases the risk of R & D and reduces third parties' investment incentives.[41] In this model, tying requires a commitment because, otherwise, the tying decision will be sub-optimal *ex post*. Knowing this, the entrant will not be deterred.[42] The model yields substantially the same results whether there is one integrated potential entrant or one potential entrant to one market and a different potential entrant to the other market.[43] In these models, tying is not always profitable for the incumbent. Its rationality will depend on which of two opposing effects prevails. The incumbent faces a trade-off between capturing some of the surplus resulting from successful entry in one market through its monopoly in the other market, according to the logic of the Chicago critique, and seeing its profit reduced to zero as a result of successful entry to both markets.[44] Whether the incumbent engages in exclusionary tying depends on the share of surplus that it can appropriate if there is successful entry in one market. The smaller this parameter, the more likely it is that the concern about the risk of displacement in both markets will outweigh the prospect of capturing a share of the surplus resulting from successful entry in one market.[45] The welfare implications of tying in this model are negative for both social and consumer welfare.[46]

A variant of the model considers the possibility of R & D investment by the incumbent. An integrated entrant and the incumbent are engaged in a technology race.[47] Tying in this model has two opposing effects: it strengthens the incumbent's R & D investment incentive and lowers the entrant's. The incumbent can now only benefit from its own innovation while the entrant's success is made conditional on succeeding in both markets.[48] The social welfare effect of tying in this setting is ambiguous because duplication of R & D investment is not necessarily beneficial. The riskier R & D, the more beneficial diversification becomes because it increases the likelihood of success. But if R & D is not particularly risky, diversification of research lines can be socially wasteful.[49] The effect on consumer welfare is also uncertain, but

41. Choi & Stefanadis, *supra* note 25, at 52–54.
42. *Id.* at 53, 61.
43. *Id.* at 62.
44. *Id.* at 60.
45. *Id.* at 61.
46. *Id.* at 62.
47. *See id.* at 64–70.
48. *Id.* at 66–67.
49. *Id.* at 69.

likely to be negative because consumers only benefit if the entrant is successful in both markets, which is made less likely by the incumbent's tying.[50]

This analysis shows that investment incentives may be negatively affected by tying. In particular, while welfare effects are not always clear-cut, tying is capable of excluding a competitor from the market. It is not obvious, however, that the excluded competitor would be an equally efficient competitor. The effect of tying here is on *ex ante* investment incentives. Whether the competitor is an equally efficient competitor based on productive efficiency and product value depends on the outcome of the investment. Whether the competitor is an equally efficient competitor based on dynamic efficiency is not clear because, when the incumbent can also invest in R & D, which is the most plausible case in practice, the model does not predict which firm's R & D project is more efficient or more likely to succeed. The model does, however, predict that the benefit of diversification depends on the risk of R & D. Therefore, the practical implications of the model are that in innovation-intensive industries where R & D is risky, tying is likely to reduce efficient investment incentives of entrants. More generally, where entry requires risky upfront R & D investment, tying may reduce the investment incentives of potential rivals. This is not always necessarily harmful to short-term social welfare because duplication of R & D efforts may be wasteful. In the long-term, however, investment incentives constitute an important competitive dynamic, and the cost of false acquittals and under-deterrence far outweighs the risk of allowing some wasteful R & D to take place. It seems, therefore, that at least in industries where the competitive process is characterised by risky and significant R & D investments, tying by a monopolist of complementary products could be harmful to long-term social welfare and productivity.

E. Post-Chicago Non-Interventionism, Decision Theory and Policy Implications

While the post-Chicago literature convincingly explains that tying may be anti-competitive, the policy implications of this position are far from clear. Most economists, who have identified plausible theories of harm of tying, have also cautioned about drawing conclusions in terms of competition law prohibitions

50. *Id.*

from their studies.[51] The post-Chicago non-interventionist literature has emphasised that, while the Chicago School relied on theoretical, stylised models, so did the post-Chicago literature, whose models for anti-competitive tying rest on sets of very specific assumptions.[52]

However, a number of considerations lead to a reassessment of the post-Chicago literature and its significance for the development of EU competition law.

Firstly, it is not necessarily the case that the assumptions of the models in question are very specific. For exclusionary tying to occur, the basic market structure assumptions of the post-Chicago models are that the incumbent has a monopoly or substantial market power in the tying market and that there are economies of scale or network effects on the tied market or the incumbent has a monopoly on the tied market. Under these assumptions, the post-Chicago literature shows that tying is capable of excluding an equally efficient competitor of the dominant undertaking. This is not equivalent to saying that under these assumptions tying is always used to exclude an equally efficient competitor and even less that tying is always detrimental to social welfare. These conditions are necessary but not sufficient for tying to be anti-competitive. However, as necessary conditions, they are not implausible or too specific. In any event, there is no difficulty in limiting the application of Article 102 to markets with these structural features.[53]

Secondly, the scepticism of some authors about the policy implications of post-Chicago models depends, crucially, on the standard they adopt. Economists generally adopt, either explicitly or implicitly, and by default, a short-term social welfare standard. Whinston, for instance, points out that the welfare effects of the anti-competitive tying he studies are ambiguous. While consumers are generally worse off as a result of exclusion, the social welfare effects are uncertain because of "the ambiguous effects of price discrimination and the usual inefficiencies in the number of firms entering an industry in the presence of scale economies and oligopolistic pricing."[54] Carlton and Waldman similarly caution that the social welfare implications of their model of leveraging market power to a newly emerging market are ambiguous because

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51. *See* Carlton & Waldman, *supra* note, 25 at 197, 203, 213 (illustrating a specific setting in which the authors argue that banning tying is socially optimal); Whinston, *supra* note 25, at 839.

52. Keith N. Hylton & Michael Salinger, *Tying Law and Policy: A Decision Theoretic Approach,* 69 ANTITRUST L. J. 469, 497–98 (2001).

53. *See* TFEU art. 102, *supra* note 12.

54. Whinston, *supra* note 25, at 839 (citation omitted).

the entrant's incentive to enter the tied market is the prospect of monopoly profits in the emerging market. Therefore, entry may in fact decrease social welfare.[55] But short-term social welfare is neither the objective nor the test in Article 102. Article 102 prohibits conduct capable of excluding an equally efficient competitor from the market in a way which is detrimental to long-term social welfare and productivity. In the absence of evidence to the contrary, the law assumes that conduct that excludes equally efficient competitors has a long-term detrimental effect on the key parameters of a competitive market.[56] While conduct that excludes an equally efficient competitor may lead to increased, or equal, social welfare in the short-term, it is deemed to be detrimental to social welfare in the long-term because of lower market-wide incentives to innovate, X-inefficiencies, and long-term entry deterrence.[57] On this analysis, the post-Chicago literature does provide a clear steer for EU competition law because it shows that tying is capable of excluding an equally efficient competitor from the market.

Thirdly, the law is not concerned with designing legal rules that reflect given economic models. The law is concerned with designing rules that minimize error costs, while pursuing the objectives of Article 102.[58] When it deals with complex market behaviour, the law has no choice but to tolerate errors, whether false convictions or false acquittals.[59] The problem lies in striking the right balance. In this regard, it must be stressed that under Article 102, dominant undertakings are always allowed to produce evidence of an objective justification for their conduct, and the legal burden rests on the competition authority or claimant to prove to the required legal standard that the practice under review is anti-competitive.[60] The post-Chicago literature limits itself to examining instances of exclusionary tying, but the law subsumes that analysis under a broader framework, in which any legitimate objective of tying is always taken into account.[61]

Finally, it is true that certain post-Chicago models are concerned with the replacement of the incumbent monopolist by the entrant's monopoly. Therefore, prohibiting tying based on these models would result in a policy in favour of monopolies by

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55. *See* Carlton & Waldman, *supra* note 25, at 213.

56. *See* NAZZINI, *supra* note 4, at 221–56.

57. *Id.* at 214.

58. *Id.* at 107–52.

59. On the principle that the legal tests in competition law should reflect the balance between the risks and costs of false convictions and false acquittals, over-deterrence and under-deterrence, *see* NAZZINI, *supra* note 4, at 31 and the literature cited therein.

60. *Id.* at 287–94.

61. *See infra* Section V.

different undertakings in complementary markets. From an aggregate welfare point of view, however, it is not clear that a setting where two complementary markets are monopolised by different undertakings, is superior to a setting where the same undertaking monopolises both markets. In fact, the contrary is generally true because of the double marginalisation problem. When the same undertaking monopolises both markets, it will internalise the effect of the price of the complementary product on the price of the primary product. If a different undertaking monopolises the complementary product market, it will only take into account the effect of the price of the complementary product on its own profits. The result is that output is lower if two different undertakings monopolise the primary and the complementary product markets than if the same undertaking does.[62] However, it is not true that a policy inspired by these models would exhibit a bias towards separate monopolies of complementary products. Entry may result in a more efficient monopoly on both markets. In Choi and Stefanadis's model, an integrated entrant may replace the monopoly in both markets.[63] In Carlton and Waldman's model, the entrant replaces the incumbent in the tied market in order to challenge its market power in the tying market.[64] In those models, tying is not, therefore, a way of preventing double marginalisation, but an exclusionary device which allows a less efficient monopoly to protect its position on all markets by virtue of its incumbency advantage alone.

But the double marginalisation argument suffers from a more serious flaw, which it shares with the Chicago critique in which it originates. It deals with the hypothetical, highly stylized setting of two monopolised complementary products. This may be the structure of game theoretic models, but market reality is different. Generally, tying occurs in circumstances resembling Whinston's model of a supplier of the primary product, who competes with an inferior substitute on the tying market and with an alternative version of the complementary product on the tied market.[65] Alternatively, tying occurs in circumstances resembling Whinston's model of a secondary use of the complementary product, which does not require the primary product.[66] In these settings, there is no question of replacing a single monopolist of the primary and the complementary products with two monopolists, but the incentive to tie results from the additional

62. *See* Hylton & Salinger, *supra* note 52, at 509–10; Sagi, *supra* note 14, at 16.
63. *See* Choi & Stefanadis, *supra* note 25, at 52–71.
64. *See* Carlton & Waldman, *supra* note 25, at 198–205.
65. Whinston, *supra* note 25, at 852–54.
66. *Id.* at 854–56.

market power that the incumbent gains as a result of a reduction of competition in the tied market,[67] or in the market for the secondary use of the tied product.[68] In any event, even in the case of two monopolies replacing a single monopoly, it is not clear that the double marginalisation inefficiency outweighs the potential inefficiency resulting from allowing the incumbent monopolist and not market demand to set the standard for the tied market. This may result in a standard on the tied market, which consumers value much less than the alternative. Given this uncertainty, it would appear to be a sensible policy to allow competition to decide who should monopolize the tied market, rather than give the incumbent unfettered power to impose its own product as the market standard.

There is, therefore, no reason to discount the insights of the post-Chicago literature as a tool for a better understanding and further development of the law on tying. Of course, there is no question of implementing economic models as legal rules or requiring a tying practice to be explained in light of an economic model, as the language of 'theory of harm' used by some commentators sometimes suggest. But competition authorities and courts can legitimately take these models into account in assessing the market behaviour of the dominant undertaking under Article 102. In this respect, post-Chicago theories may provide significant assistance in identifying the facts that are relevant to a number of issues arising under Article 102. For instance, whether the tying is capable of excluding an equally efficient competitor, whether it is likely to protect or strengthen the dominant undertaking's market power on the tying, the tied, or a third market, or whether it is objectively justified.

In the assessment of actual market behaviour, the post-Chicago literature discussed above points to the importance of the following factors:

1. The need for market power on the tying market. This requirement is well established under Article 102.[69]

2. The characteristics of the tied market, particularly in terms of barriers to entry and demand-related efficiencies, including economies of scale and network effects.

3. The asymmetry between the dominant firm and its competitors, in that the latter must not be able to replicate the

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67. *Id.* at 853–54.

68. *Id.* at 854–55.

69. Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 842. For a possible exception, see *infra* note 99.

behaviour of the dominant firm, in particular by offering the same bundle or entering the tying and the tied market simultaneously.

4. The key role that the incentive to tie plays in overcoming the Chicago critique. Such an incentive can be the acquisition or strengthening of market power in the tied market, the protection of market power in the tying market, or the acquisition of market power in a new market. The Commission Guidance on Article 102 now clarifies that "[t]ying or bundling may lead to anti-competitive effects in the tied market, the tying market, or both at the same time."[70] The Guidance gives one example in which tying makes entry in the tying market more difficult, namely when "the tied product is an important complementary product for customers of the tying product" and tying causes "a reduction of alternative suppliers of the tied product and hence a reduced availability of that product."[71]

5. The exclusion of competitors from the tied market as a necessary condition for competitive harm to arise. Under Article 102, the exclusion of equally efficient competitors may give rise to a *prima facie* inference of abuse.[72]

6. The difficulty of predicting the welfare effects of exclusionary tying. In EU law, however, the question is not whether tying has a positive or negative effect on short-term social or consumer welfare. The test is whether it harms long-term social welfare and productivity.[73] If equally efficient competitors are

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70. Comm'n Guidance on Art. 102, *supra* note 1, at 15.

71. *Id.* at ¶ 58.

72. *See supra* notes 57 & 58.

73. It may appear contradictory to talk about the exclusion of equally efficient competitors, which may be socially beneficial because entry is inefficient. To clarify the point, it must be stressed that the definition of an equally efficient competitor has nothing to do with whether entry by that competitor is socially efficient. An equally efficient competitor is a competitor who is as efficient as the dominant undertaking, net of first mover's advantages. A competitor with the same long-run average incremental cost ("LRAIC") – defined by the European Commission as the average of all the (variable and fixed) costs that a company incurs to produce a particular product — as the dominant undertaking is an equally efficient competitor. This does not mean that, from the society's point of view, it is efficient to have two competitors on the market. Entry is efficient when the marginal social benefit of entry exceeds or equals the marginal cost of entry. This may not be the case when, for instance, the social benefit of the reduction in price resulting from entry is outweighed by the increased fixed cost of production due to the entrant's fixed costs. Entry can still be privately profitable for the entrant but is socially wasteful. See, for specific examples in which entry is socially wasteful, Choi & Stefanadis, *supra* note 25, at 69 and Carlton & Waldman, *supra* note 25, at 213–14. However, competition law does not assess, on a case-by-case basis, whether entry is socially desirable or not. The law is concerned with preserving equality of opportunities for undertakings on the market in a way which, on balance, enhances social welfare and productivity in the long-term. The law presumes that the exclusion of an equally efficient competitor by a dominant undertaking in order to preserve or obtain market power harms long-term productivity and social welfare. Well-functioning markets are generally able to address problems relating to the inefficient number of undertakings on the market, for instance, through mergers. In case of market failure, regulation may prevent socially wasteful entry.

excluded, on balance, the incentives to reduce costs and invest in new technologies and product development in the long-term are likely to be negatively affected.[74] Under Article 102, therefore, whether tying is prohibited does not depend on its short-term welfare effect, but on whether it is likely to exclude equally efficient competitors, thereby reducing productivity and dynamic efficiency in the long-term.

7. The potentially more severe exclusionary effects of technological tying. The Commission Guidance on Article 102 explicitly recognizes this.[75]

8. The pro-competitive reasons for tying. These are not denied, but rather assumed in the post-Chicago literature, which, often implicitly, construes its exclusionary models as exceptions to the general proposition that tying is normally a pro-competitive practice. Under Article 102, objective justification, which includes the pursuit of efficiencies, is a defence to a *prima facie* case of abusive tying.[76]

IV. THE DEVELOPMENT OF THE TEST IN EUROPEAN UNION LAW

A. General

The case law has not developed a clear test for anti-competitive tying, not least because of the paucity of the cases in this area and the way in which issues have been raised, or not, before the EU Courts. In the *Android* case, the European Commission has a unique opportunity to clarify the test for tying.[77] Such a test should include proof of the following elements to establish a *prima facie* case of unlawful tying under Article 102:

1. A dominant position on the tying market;
2. Structural features of the tied market making anti-competitive tying plausible;
3. The requirement that the components of the bundle must be separate products;
4. The requirement that customers must be coerced to obtain the tied product together with the tying product;

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74. NAZZINI, *supra* note 4, at 214.

75. *See* Comm'n Guidance on Art. 102, *supra* note 1, at 15 ("The risk of anti-competitive foreclosure is expected to be greater where the dominant undertaking makes its tying or bundling strategy a lasting one, for example through technical tying which is costly to reverse. Technical tying also reduces the opportunities for resale of individual components.").

76. *See id.* at 16. On objective justification for tying, see *infra* Section V.

77. *See* European Commission Press Release, *supra* note 8.

5. The anti-competitive effect of the tying, which consists in two elements, namely the likely exclusion of equally efficient competitors from the tied market[78] and the acquisition, maintenance, or strengthening of market power on an affected market (the tying market, the tied market, or a related emerging market).

These elements will be discussed in the following sections. Once a *prima facie* case of abuse has been established, it is open to the dominant undertaking to rebut it by raising an objective justification defence. Objective justification will be dealt with in section V.

B. The Dominant Position on the Tying Market

1. General Requirement of Dominance on the Tying Market

The general rule is that, for tying to be abusive, the undertaking must be dominant on the tying market. In *Eurofix-Bauco v. Hilti*, Hilti was dominant on the tying market for Hilti-compatible cartridges for Hilti nail guns.[79] The tied products were Hilti-compatible nails. Hilti was also dominant on the market for nail guns. The dominant position on the market for nail guns was the source of Hilti's ability to exclude competitors in the markets for Hilti-compatible consumables. Hilti's market shares were 55% on the market for nail guns and of 70% and 70% to 80% on the markets for cartridges and nails.[80] Undertakings active on the markets for nail gun consumables had no choice but to supply Hilti-compatible products if they wanted to achieve "the economies of scale necessary to be both competitive and profitable."[81]

In *Microsoft I*, the Commission found that Microsoft had been tying its Windows Media Player (WMP) to its Windows client PC operating system since the launch of Windows 98 Second Edition

78. The exclusion must be at least likely. *See* Case C-23/14, Post Danmark A/S v. Konkurrencerådet (*Post Danmark I*), ECLI:EU:C:2015:651 EUR-Lex – 62014CC0023, at ¶¶ 79–85 (May 21, 2015) (not yet published in E.C.R.). Post Danmark II concerned conditional rebates. However, the same principle should apply to tying because tying, as conditional rebates, is a normal business practice which may have anti-competitive effects in certain circumstances. It would appear logical, therefore, to apply at least the same degree of likelihood of exclusionary effects to tying as that which applies to conditional rebates.

79. Commission Decision 88/138 of Dec. 22, 1987, Relating to a Proceeding Under Article 86 of the EEC Treaty (IV/30.787 and 31.488 — Eurofix-Bauco v. Hilti), 1987 O.J. (L 65) 19, 34.

80. Case T-30/89, Hilti AG v. Comm'n, 1991 E.C.R. II-1441, at ¶ 85.

81. Commission Decision 88/138, *supra* note 79, at 34.

until the date of the Commission decision in 2004.[82] Microsoft had an "overwhelmingly dominant position" on the world-wide market for client PC operating systems,[83] which only allowed for "fringe competition."[84] Microsoft's market shares were above 90% for most of the period of the infringement and above 80% for 8 years.[85] The next largest competitor had a market share not exceeding 3%.[86] There were also high barriers to entry to the market in the form of indirect network effects,[87] evidence that Microsoft was able to behave independently of its customers,[88] and financial performance figures consistent with substantial market power.[89] It is worth noting that the Commission carried out this analysis even though Microsoft conceded in the administrative procedure that it held a dominant position on the world-wide market for client PC operating systems.[90] A plausible explanation for the Commission's approach is that the features of Microsoft's dominant position were relevant to the analysis of tying beyond the bare assertion that Microsoft held a dominant position. The same approach was adopted in *Microsoft II*, a commitments decision concerning Microsoft's tying of its web browser Internet Explorer to its PC client operating system Windows.[91] Although Microsoft accepted that it had a dominant position on the world-wide market for client PC operating systems,[92] the Commission examined the features of Microsoft's dominant position, emphasizing its high market share of around 90% held for ten years, the strong network effects on the market, and the high cost of developing and testing a new client PC operating system.[93]

In *Android*, the Commission takes the preliminary view that Google is dominant on three markets: the markets for general internet search services, the market for licensable smart mobile operating systems, and the market for app stores for the Android

82. Commission Decision of Mar. 24, 2004, Relating to a Proceeding Under Article 82 of the EC Treaty (Case COMP/C-3/37.792 Microsoft), http://ec.europa.eu/competition/antitrust/cases/dec_docs/37792/37792_4177_1.pdf [hereinafter Microsoft I].

83. *Id.* at ¶ 435 (relying on the concept of "superdominance" in the Opinion of AG Fennelly in Cases C-395/96 & 396/96, Compagnie Maritime Belge Transports v. Comm'n, 2000 E.C.R. I-1442).

84. *Id.* at ¶ 434.

85. *Id.* at ¶¶ 430–35.

86. *Id.* at ¶ 434.

87. *See id.* at ¶¶ 448–59.

88. *See id.* at ¶¶ 462–63.

89. *See id.* at ¶ 464.

90. *See id.* at ¶ 429.

91. Commission Decision of Dec. 16, 2009, Relating to a Proceeding Under Article 102 of the Treaty on the Functioning of the European Union and Article 54 of the EEA Agreement (Case COMP/C-3/39.530 – Microsoft (Tying)), http://ec.europa.eu/competition/antitrust/cases/dec_docs/39530/39530_2671_3.pdf [hereinafter Microsoft II].

92. *Id.* at ¶¶ 17, 30.

93. *Id.* at ¶¶ 24–30.

mobile operating system. The market shares that the Commission published in its press release on the *Android* investigations are those in the EEA,[94] but it is unclear what the geographical scope of these markets are, although it is likely that, in line with previous practice, the market for general internet search services is probably either national or EEA-wide in scope.[95] It will be recalled that the practices under review are the alleged tying of Google Search with Play Store, the alleged tying of Google Chrome with Google Search or Play Store, and the alleged tying of GMS, which includes Play Store, with versions of Android, whether supplied by Google or by other undertakings, complying with certain compatibility requirements. The key tying product is, therefore, Play Store. With respect to this product, the assessment of dominance would appear to be the following: consumers need apps to exploit the functionality of their smart phones. Apps may be pre-installed, but consumers also expect to be able to choose their own apps once they buy a smart phone. App stores are applications that allow consumers to download apps. Apps need to run on operating systems. As consequence, app stores for operating system A are not substitutable for app stores for operating system B, given that apps written for operating system A will not run on operating system B and vice versa. There is, therefore, a market for app stores for Android. On such a market, Play Store is dominant because, presumably, it is the most frequently pre-installed app store on Android smart phones and most app downloads for Android are from Play Store. However, even if this theory held true, it would still not mean that Google has a dominant position on the market for app stores for Android and, even less, that anti-competitive tying would be a plausible exclusionary strategy. The point can be illustrated by comparing the position of Play Store and the dominant position held by Microsoft on the world-wide market of client PC operating system. In both *Microsoft I* and *Microsoft II*, there were strong network effects, in that developers would write applications for Windows and had no or little incentive to write applications for other operating systems. In *Android*, developers can write applications for alternative app stores that would run equally smooth on any Android device.[96] Because Android is an open source operating

94. *See* European Commission Press Release, *supra* note 8.

95. Case C-20/32, Microsoft/Yahoo! Search Business, 2010 E.C.R. 5727, ¶ 98. Here, the Commission considered the market as either EEA-wide or national, without deciding the point.

96. By way of example, Galaxy Apps run on Samsung Android Galaxy devices and are pre-installed on many Samsung smartphones. Samsung claims that Galaxy Apps will be available to more than 130 million users across 161 countries. *Samsung Electronics Launches Samsung GALAXY Apps,* SAMSUNG NEWSROOM (July 11, 2014),

system, as long as the system does not become fragmented and compatibility is ensured, developers can build app stores knowing that they would run on all compatible versions of Android. This is the opposite to what occurred in *Microsoft I* and *Microsoft II*: software developers and content providers would only write software and content for Windows and had no incentive to do so for other operating systems. The lack of interoperability that gave rise to strong indirect network effects in *Microsoft I* and *Microsoft II* is simply absent in *Android.* This is important in a tying case: if there are no significant barriers to entry or expansion on the tying market, a dominant position on that market is implausible. This renders an anti-competitive tying strategy equally implausible: if the allegedly dominant undertaking engaged in tying to the detriment of consumers, the latter would simply switch to better products on the tied and on the tying market. Furthermore, app stores markets are two-sided markets. A deterioration of the quality or increase of price of apps on Play Store would cause developers to switch to other Android app stores or to Apple App Store.

The Commission appears to be considering also the tying of Google Chrome with Google Search. The tying product would be Google Search. Even on the Commission's own theory that Google could be dominant in general search services, it does not follow that Google Search, Google's proprietary search app, can be a tying product. General search services are services that allow users to search the web for information not limited to a pre-determined category. In order to search content on the web, consumers may use a general search website or an app or enter a query in their internet browser address bar. General search services are in no way limited to the use of a search app. Therefore, on the Commission's own theory of harm, Google would have to tie Google Chrome not to Google Search, but to its general search services, for example by preventing Google searches on smartphones with no Google Search, which does not appear to be happening.[97] Alternatively, the Commission may argue that Google Search is a must-have app on a smartphone, in the same way as it argues,

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https://news.samsung.com/global/samsung-electronics-launches-samsung-galaxy-apps. Amazon AppStore has 400,000 apps available and is pre-installed on a number of devices, including the Fire Phone, Blackberry 10, and Verizon's Samsung Galaxy S 6, Galaxy Note5 and Galaxy Core Prime. Furthermore, developers can distribute their apps over the web or through messaging apps such as WeChat and Facebook. *See* Ben Fox Rubin, *Amazon Appstore Nears 400K Apps on 'Huge Progress*,' CNET (Mar. 4, 2015, 1:46 PM), https://www.cnet.com/news/amazon-appstore-nears-400k-apps-on-huge-progress/.

97. *See e.g.*, Torsten Körber, *Let's Talk About Android – Observations on Competition in the Field of Mobile Operating Systems*, (July 4, 2014) (unpublished expert opinion), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2462393.

effectively, that Play Store is a must-have app on Android devices. However, this argument faces a formidable obstacle because Google Search is manifestly not pre-installed on iPhones. It can be downloaded from Apple App Store, but users may choose whether to do so. Therefore, the use of Google Search, as opposed to general search services, as a tying product is implausible, even on the assumption that Google is dominant in general online search services.[98]

C. Structural Features of the Tied Market

In a tying case, dominance on the tying market is not a sufficient condition for the dominant undertaking to have the ability to exclude rivals from the tied market. Were it otherwise, any monopolist would be able to monopolise all neighbouring markets, which clearly is not the case. The structural features of the tied market are relevant. The practice of the Commission, never contradicted by the EU Courts, goes clearly in this direction.

Already in *Eurofix-Bauco v Hilti*, the Commission considered relevant that Hilti was dominant on the tied market for Hilti-compatible nails in the (then) European Economic Community.[99] Similarly, in *Tetra Pak II*, Tetra Pak was dominant or had a leading position on the tied markets for aseptic and non-aseptic cartons respectively.[100] This approach was refined and further established in *Microsoft I* and *Microsoft II*.

In *Microsoft I*, the Commission defined a separate market for streaming media players as the market on which the foreclosure effects of the tying practice occurred,[101] but made no finding that Microsoft had a dominant position or even a leading position on the tied market at the time when the infringement started. The case could therefore be described as a pre-Chicago leveraging case

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98. Nor can the Commission argue that, in order to prove that Google engaged in anti-competitive tying, it is not necessary to demonstrate dominance on the tying market. It is true that EU law appears to accept that, when the tying and the tied markets are linked to the market or markets on which the undertaking is dominant, in special circumstances dominance on the tying market may not be necessary. Case T-83/91, Tetra Pak Int'l S.A. v. Comm'n, 1994 E.C.R. II-762, at ¶¶ 117–22, *aff'd,* Case C-333/94, Tetra Pak Int'l S.A. v. Comm'n, 1996 E.C.R. I-5987, at ¶¶ 21–33. This doctrine, however, was applied only in one case and has never been followed since. Its legal and economic foundations are shaky to say the least, and even the only case in which the doctrine was apparently applied, is of doubtful interpretation and, to the extent that it did consider that dominance on the tying market was not required, probably wrongly decided. NAZZINI, *supra* note 4, at 181–84.

99. Commission Decision 88/138, *supra* note 79, at 34, *appeal denied,* Case T-30/89, Hilti AG v. Comm'n, 1991 E.C.R. II-1441, at ¶¶ 89–94. The Court of Justice dismissed an appeal against the judgment of the Court of First Instance in C-53/92, Hilti AG v Comm'n 1994 E.C.R. I-693.

100. Case C-333/94, Tetra Pak Int'l S.A. v. Comm'n, 1996 E.C.R. I-5987, at ¶¶ 99–102.

101. Case T-201/04 Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶¶ 402–25, 427.

in which the dominant position in market A is used to get market power in market B. However, there are significant differences between the market context assumed in the economic critique of leveraging and the market context in *Microsoft*. First, in *Microsoft I*, customers were offered the tied product at no observable extra price. There was, however, a transaction cost in obtaining a second product on the tied market from a competitor.[102] Second, for a significant number of consumers, the incentives of obtaining a substitute for the tied product were low in any event due to lack of sophisticated requirements and asymmetric information about the quality and relative performance of the products competing with the tied products.[103] Third, demand on the tied market was strongly dependent on demand on the tying market, in that most consumers preferred media functionality to be pre-installed on their PC.[104] Fourth, there were strong indirect network effects on the tied market because both software developers and content providers had a strong incentive to design their product for the most widely available media player.[105] Finally, Microsoft's dominant position on the tying market was very strong.[106] These characteristics of the tying and the tied markets and the links between the two gave the dominant undertaking the ability and the incentive to exclude rivals from the tied market. The Court of First Instance in *Microsoft I* confirmed that dominance on the tied market is not an element of the test for abusive tying.[107] However, in the analysis of the abuse, the Court considered relevant all the key elements relied on by the Commission.[108]

In *Microsoft II*, the Commission specifically analysed the indirect network effects on the tied market, expressing the view that the alleged tying practice provided content providers and software developers incentives not to provide content and software for other web browsers.[109]

In the *Android* investigation, the Commission alleges the anti-competitive tying of Google Chrome with Google Search or Play Store, of Google Search with Play Store, and of Play Store with versions of Android complying with minimum compatibility

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102. *Id.* at ¶¶ 851–52, 866–67.
103. *Id.* at ¶¶ 845, 858, 865.
104. *Id.* at ¶¶ 809, 848.
105. *Id.* at ¶¶ 879–96.
106. *Id.* at ¶¶ 843–44.
107. *Id.* at ¶ 859.
108. *Id.* at ¶¶ 1037–58. However, having found that Microsoft's tying had the likely effect of foreclosing competitors because it denied competitors the most efficient and effective distribution channel, the Court held that the presence of indirect network effect, while still relevant, was not necessary to the finding of abuse. *Id.* at ¶ 1059.
109. *See* Microsoft II, *supra* note 91, ¶ 56.

requirements. Therefore, the tied markets would appear to be the market for general online search and the market for licensable smart operating systems.

In regard to general online search, it can be noted that one of the tied products is alleged to be Google Chrome. A possible theory of harm could be that by foreclosing competing web browser apps, Google is protecting or strengthening an alleged dominant position on general online search on the view that a pre-installed browser's search app generates significant search traffic. However, the structural features of a potential Android web browser market do not appear to be conducive to anti-competitive tying. Firstly, competition on this market would appear to be quite healthy, with numerous browsers being readily available to consumers.[110] Furthermore, there are arguably no direct network effects in web browsing: the value that each individual user derives from a web browser does not increase with the number of users of that same browser. There may be indirect network effect in that browser extensions, that is, plug-ins that change the functionality of a browser, are written to a specific browser. But such indirect network effects are likely to be extremely limited. Finally, the barriers to entry on the alleged web browser market may well be low, as demonstrated by the significant number of Android browsers available for download.[111] Potential exclusion of competing suppliers of Android web browsers would thus not seem to be supported by the analysis of the structural features of the market.

Turning then to general online search as such, the existence and extent of network effects is controversial. In regard to direct network effects, it may appear plausible that the more searches are made, the more refined and accurate the results are likely to be. This is, however, probably better described as learning by doing, than as a network effect. In any event, the degree to which increased search volume improves search results is unclear. Some economists have argued that data is subject to diminishing returns to scale and that the benefits of scale may be realised at relatively

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110. Based on publicly available Google Play data, at least six commercial browsers other than Chrome have been installed at least 100 million times: Firefox, Opera, Opera Mini, Samsung Internet, UC Browser, and UC Browser Mini. Browsers that have been installed at least 50 million times include CM (Cheetah) Browser, Dolphin, and Downloader & Private Browser. Also, the latest data shows that about one-third of mobile browsing is occurring inside the Facebook app. *See Mobile Overview Report October – December 2016*, SCIENTIAMOBILE 22 (2016), https://www.scientiamobile.com/page/wp-content/uploads/2017/02/MOVR-Q4-2016-Report.pdf. If this data is correct, this would be evidence that the competitive structure of the tying market is, *prima facie*, incompatible with a successful tying strategy.

111. Google Play has 20 Android browsers for download. *See Apps*, GOOGLE PLAY, https://play.google.com/store/search?q=browser&c=apps&hl=en (last visited Apr. 21, 2018).

low volumes.[112] This would appear consistent with market evidence that shows that Google was able to overtake Yahoo!, having initially fewer queries, presumably because of the quality of the results and the overall user experience. Engineering innovation may thus be as or more important than experience from previous searches.[113] There may also be indirect network effects given the multi-sided structure of the market, as advertisers value a search engine more the more users the search engine has.[114] Such indirect network effects, however, appear to be unidirectional because, while advertisers value more users, users do not necessarily value more advertisers, so that a search engine would still have to provide quality search services if it wants to retain users. Finally, online general search may well be characterised by substantial R & D and infrastructure costs.[115] However, a search engine could operate by acquiring search and indexing capability from a third party, thus avoiding incurring significant R & D and infrastructure costs.[116] In regard to licensable smart operating systems, the Commission alleges that Google is dominant in such a market. There is, however, a question over whether this is a correct market definition in the first place. The Commission has excluded from the market Apple operating systems because they are not licensed to third parties. Thus, the Commission has defined the market from the perspective of OEMs: if the quality of Android deteriorates, device manufacturers would switch to a different licensable operating system, but could not switch to Apple iOS, which is not licensed to third parties. This market definition seems artificial as it leaves completely out of the picture carriers and

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112. *See, e.g.,* Andres V. Lerner, The Role of "Big Data" in Online Platform Competition 35–38 (Aug. 26, 2014), https://ssrn.com/abstract=2482780.

113. *See* Renato Nazzini, Google *and the (Ever-stretching) Boundaries of Article 102 TFUE*, 6 J. EUR. COMPETITION L. & PRAC. 301, 306 (2015).

114. Ioannis Lianos & Evgenia Motchenkova, *Market Dominance and Search Quality in the Search Engine Market*, 9 J. COMPETITION L. & ECON. 419, 420 (2013).

115. *Id.* at 428.

116. There are several examples of this, which are reported or known in the industry. Of course, precise details or factual verification of these matters goes beyond the scope of this article but if they were established, they would lend support to the theoretical argument that a search engine could operate by acquiring search and indexing capability from third parties. For example, it seems that, since 2009, Microsoft has provided search results for most of Yahoo's search queries. Bing provides search results for Apple's Siri digital assistant. Yahoo! Japan used Google's search engine from 2001 to 2004, then used its own search technology, and in 2010 switched back to Google. As of January 2016, Bing powers AOL Search. Google had previously provided AOL's search results. It would also appear that third parties can also provide specialized search results or content to a general search engine. For example, it would appear that: 1) DuckDuckGo gets its search results from numerous sources, including Wikipedia, Yahoo!, Yandex, Yelp, and Bing; 2) Bing provides English search results to Baidu users in China, while Baidu provides Chinese language product search results to Bing users in China; 3) WolframAlpha provides specialized content to Bing, Siri, and DuckDuckGo.

consumers. For these two latter categories of users, there is a choice of switching to an Apple device and, therefore, to Apple iOS, in response to a deterioration of the quality of Android.[117] Therefore, Google is constrained in its ability to deteriorate the quality of its own licensable version of Android by the effect that carriers and consumers' demand would have on OEMs' demand. This analysis is in line with the practice of the Commission.

In *Microsoft I*, the Commission defined the market for client PC operating systems without distinguishing between licensable and not licensable systems, thus including Apple operating systems in the market definition.[118] Recognising the competitive pressure that Apple iOS exercises on Android casts doubt on the rationality of the alleged anti-competitive tying: if Google were foreclosing competing and superior versions of Android, this would lead to carriers and consumers switching to Apple devices, thus reducing not increasing Google's ability to profit from its proprietary Android apps. But even on the Commission's own market definition, it is unclear how Google could be dominant in the market for licensable smart operating systems. Google does not charge a fee to license Android. Therefore, dominance would have to result in the deterioration of the quality of Google's own version of Android. If this were to happen, however, OEMs could switch to another free version of Android. To do so would not appear to involve any switching costs and could be done almost instantaneously. Dominance would thus seem to be implausible in a market for an open source free operating system, such as Android. Finally, any assessment of dominance on this alleged market would have to take into account the double-sided structure of the operating system: a degradation of the quality of Android would result not only in consumers and OEMs switching to Apple, but in developers doing so too, thus exacerbating the loss of revenue for Play Store.[119]

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117. Market evidence would tend to suggest that competition between Apple and Google does take place. For example, one study of Chinese consumers in 2015 showed that 32% of Android users planned to switch to an iPhone in the following 12 months. Philip Elmer-DeWitt, *Here's Why Apple is Gaining on Android in China*, FORTUNE (July 7, 2015), https://fortune.com/2015/07/07/apple-android-china-switch/. It also appears that in 2016, Apple launched an Android app to facilitate the move from the Android ecosystem to the Apple one. *See Move from Android to iPhone, iPad, or iPod Touch*, APPLE, https://support.apple.com/en-gb/HT201196 (last visited Apr. 21, 2018).

118. *See* Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶¶ 324–42.

119. This is against the background of Apple already making much more profit than Google from its app store: in 2015, according to industry reports, Apple made 75% more profits than Google from app downloads. *See* Chance Miller, *iOS App Store Brings in 75% More Revenue than Play Store Despite Difference in Downloads*, 9TO5MAC (Jan. 20, 2016, 7:04 PM), https://9to5mac.com/2016/01/20/app-store-ios-downloads-vs-android-revenue/.

D. The Two Product Test

For a tying abuse to be established, the tying and the tied product must be separate products. The test to determine whether two components of a bundle are distinct products asks whether there is independent demand for each component of the bundle at the level of the supply chain where the restriction of competition is alleged to take effect. There is independent demand for product A or B if consumers require each product separately and a stand-alone supplier is able to satisfy this demand as efficiently as an integrated supplier.[120]

When available, historical evidence of supply and demand may be relevant to the issue of whether two components of a bundle are two distinct products. The fact that undertakings supplying only one component have been active for a long period of time may be strongly probative evidence that there is independent demand for either component and that stand-alone producers of one component can efficiently supply it.[121] In *Hilti*, the Court of First Instance upheld the Commission's definition of a separate market for nails to be used with Hilti nail guns. The question was whether nail guns, cartridges, and nails were a unitary product or constituted three separate markets. The Court focused on the demand-based market definition test of substitutability.[122] The Court considered the structure of supply and noted that for decades there had been independent suppliers of nails who did not manufacture nail guns. This was in itself "sound evidence" that

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120. Comm'n Guidance on Art. 102, *supra* note 1, at 51 (referring specifically to independent demand for the tying product, which, however, implies that there must also be independent demand for the tied product). "Whether products will be considered [by the Commission] to be distinct depends on customer demand. Two products are distinct if, in the absence of the tying [or bundling], a substantial number of customers would purchase or would have purchased the tying product without also buying the tied product from the same supplier, thereby allowing stand-alone production for both the tying and the tied product." *Commission Notice Guidelines on Vertical Restraints*, at 61, SEC (2010) 411 final (Oct. 5, 2010) (footnote omitted) [hereinafter *Commission Notice*].

121. Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 927 (using the phrase "serious evidence"); Case T-30/89, Hilti AG v. Comm'n, 1991 E.C.R. II-1441, at ¶ 67 (using the phrase "sound evidence"). In the text, the terminology "strongly probative evidence" is preferred to the terminology used by the Court of First Instance, as the latter is vague and imprecise and has no technical meaning in the theory and law of evidence. *See also* Comm'n Guidance on Art. 102, *supra* note 1, at 51 ("Evidence that two products are distinct could include direct evidence that, when given a choice, customers purchase the tying and the tied products separately from different sources of supply, or indirect evidence, such as the presence on the market of undertakings specialised in the manufacture or sale of the tied product without the tying product or of each of the products bundled by the dominant undertaking, or evidence indicating that undertakings with little market power, particularly in competitive markets, tend not to tie or not to bundle such products.") (footnote omitted); *Commission Notice, supra* note 114, at 61.

122. Case T-30/89, Hilti AG v. Comm'n, 1991 E.C.R. II-1441, at ¶ 64.

there was a separate market for nails.[123] The Court went on to say that if nail guns, cartridges, and nails were held to be a unitary product, this would have meant that a supplier of nail guns would have been able to exclude all competition from manufacturers of components.[124] However, under EU competition law, "'any independent producer is quite free . . . to manufacture consumables intended for use in equipment manufactured by others, unless in doing so it infringes a competitor's intellectual property right.'"[125]

This statement is very wide. Should it be interpreted to mean that any dominant supplier of a product abuses its dominant position as soon as it restricts the ability of other undertakings to supply complementary products? In reality, the Court was addressing a market definition issue, namely whether the tying and the tied complements were separate products for the purpose of EU competition law. The Court had just found that independent suppliers of the tied product had been operating for a long period of time. The implication was that it was not only theoretically possible, but also viable to supply nails separately from guns and cartridges. A tying practice was, therefore, capable of excluding competitors who were at least as efficient as the dominant undertaking in supplying nails. Otherwise, it would have been inexplicable why independent suppliers could have been on the market for a very significant period of time and why established customers of the dominant undertaking were prepared to purchase nails from them.[126]

The independent demand test must be performed separately for each product. In *Microsoft I*, the Court of First Instance rejected Microsoft's argument that the test should be whether there was demand for the tying product without the tied product.[127] As the Court rightly noted, such a test would have meant that complementary products could not be separate products.[128] This would have been absurd as the same benefits that arise from competition in terms of lower prices and innovation may arise when different undertakings compete for different complementary products of an integrated system. Furthermore, it

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123. *Id.* at ¶ 67; *see also* Case C-333/94, Tetra Pak Int'l S.A. v. Comm'n, 1996 E.C.R. I-5987, at ¶ 36; Case T-83/91, Tetra Pak Int'l S.A. v. Comm'n, 1994 E.C.R. II-762, at ¶ 82.

124. Case T-30/89, Hilti AG v. Comm'n, 1991 E.C.R. II-1441, at ¶ 68.

125. Case C-333/94, Tetra Pak Int'l S.A. v. Comm'n, 1996 E.C.R. I-5987, ¶ 36; *see also* Case T-83/91, Tetra Pak International v. Comm'n, 1994 E.C.R. II-762, at ¶ 83; Case T-30/89, Hilti AG v. Comm'n, 1991 E.C.R. II-1441, at ¶ 68.

126. *See* Commission Decision 88/138, *supra* note 79, at 26, 28–29 (This point did not arise on appeal).

127. Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 919.

128. *Id.* at ¶ 921.

may well be the case that entry in the market for one complementary product is necessary for an entrant to expand into the other complementary markets as simultaneous entry in all markets may be prohibitively risky. This does not mean, however, that it is correct to determine whether there is independent demand for the tied product only without also assessing whether there is independent demand for the tying product. It is a matter of regret that the Court did not clarify this point. However, on the facts, the Court noted that there was independent demand for client PC operating systems without media players.[129] The Court further noted that it was relevant at which level of the distribution chain the tying was taking place. The PC manufacturer had a separate demand for all hardware and software components of a PC, which it assembled and sold as a bundle to the final consumers through a retailer or directly through a vertically integrated sales outlet. In *Microsoft I*, the tying was occurring at the level of PC manufacturers. Therefore, whether there was independent demand for client PC operating systems and streaming media players had to be assessed at the level of the OEM.[130]

Microsoft I also addressed the difficult issue of the time frame for the application of the two-product test. The Court of First Instance recognized that the two-product test must be applied in a dynamic way. Two distinct products may become a unitary product because of technological developments and the evolution of the market.[131] The Court limited its observation to "the IT and communications industry,"[132] but there is no reason not to apply the same principle to any market where the same phenomenon may occur. The Court then said that the two-product test must be applied at the time when the abuse occurred.[133] It is difficult to disagree with this proposition as a general principle. The fact that two products may become one in the future has no impact on whether as efficient competitors have been excluded in the past, thus harming long-term social welfare and productivity. The problem is in the application of this principle. Two distinct products may have become one only recently, so that mere reliance on historical evidence would be misleading and result in a false conviction. It may also be the case that the application of the test in a fast-moving market could discourage innovation, which would lead to combining two products into a higher-quality or lower-cost unitary product. These two objections clearly raise different

129. *Id.* at ¶ 924.
130. *Id.* at ¶ 923.
131. *Id.* at ¶ 913.
132. *Id.*
133. *Id.* at ¶ 914.

problems. The former goes to whether there is an abuse in the first place, because the tying and the tied products are mistaken for two separate products, while they are a unitary system instead. The latter goes to objective justification because the two products are in fact still distinct but technological innovation and experimentation may lead to more efficient integration.[134]

In regard to the risk of a mistaken finding of separate products, the solution is to verify the two-product hypothesis based on the relevant evidence. In mature markets, the existence of stand-alone suppliers of the tied products,[135] the general interoperability of the products on the tied market with the products on the tying market,[136] distinct distribution, marketing, and licensing practices for the tying and the tied product,[137] and a significant number of consumers purchasing the tied product separately from the tying product[138] can be sufficient proof of the existence of independent consumer demand for the tied product. In developing markets, particularly in markets for new or developing technologies, historical evidence should be validated by forward-looking analysis,[139] including:

(a) how significant and differentiated the tied product is, and is likely to be, for consumers. The more significant and differentiated the tied product currently is, and is likely to be, in the future, the weaker the case that the two products are, or are likely to become, a unitary product;

(b) whether the tying and the tied products meet distinct consumer needs or have distinct functionalities. In *Microsoft I*, the Windows client PC operating system controlled the basic functions of a PC and enabled the user to run application software on the PC while streaming media players and allowed the user to listen to, or watch, audio or video content streamed from the Internet.[140] In *Microsoft II*, again Windows had a different functionality from web

134. On objective justification, see *infra* Section V.

135. Commission Decision 2007/53 of May 24, 2004, Relating to a Proceeding Pursuant to Article 82 of the EC Treaty and Article 54 of the EEA Agreement Against Microsoft Corporation (Case COMP/C-3/37.792 — Microsoft), 2007 O.J. (L 32) 23–28, at ¶ 26; Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶¶ 804, 927.

136. *See* Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 928.

137. *See id.* at ¶¶ 929–31.

138. *See id.* at ¶¶ 806, 932. Where the Commission and the Court of First Instance respectively referred to "a not insignificant number of consumers." *Id.* at ¶ 876. A not insignificant number of consumers are a significant number of consumers if the double negative is elided.

139. This analysis is also relevant to the application of the test in mature markets and may be relevant to objective justification to the extent that it is purely forward-looking, i.e. it is clear that the products are currently distinct, but they are likely to become a better or lower-cost unitary product in the future and tying is a proportionate way of achieving this aim.

140. *Id.* at ¶ 926.

browsers because the latter enabled the user to see Internet pages while the former, as 'system software,' had the different function described above;[141]

(c) whether the tying and the tied products are technically integrated in that a tied product, which is manufactured separately, does not perform in the integrated system as well as the tied product, which is manufactured together with the tying product. In examining this condition, care must be taken in discounting any technical integration which is the result of a deliberate choice of the dominant undertaking to make its tying product incompatible with complementary products supplied by competitors. Technical integration must be the result of technological development and not a strategic commitment to tying.

In *Android*, Google Search, Google Chrome, Play Store and Android are all, arguably, different products, as they can be in principle supplied by as efficient independent undertakings. The question as to whether bundling some of these products creates additional benefits goes, therefore, to objective justification.

E. Coercion

Article 102(d) describes tying as making the conclusion of a contract "subject to the acceptance by the other parties of supplementary obligations."[142] Therefore, tying requires that customers of the dominant undertaking be compelled to acquire the tied product if they wish to purchase the tying product. More generally, in the absence of coercion, competitors of the dominant undertaking could at any time persuade customers to buy their own products. In order to prevent that from happening, the dominant undertaking must either be more efficient than its competitors or deploy anti-competitive practices that provide incentives for customers not to switch in the form of loyalty rebates or multi-product rebates. These rebates call for a different type of assessment because of the incentive element of the effective price that the customer forgoes if it decides to switch its requirements, in part or in full, to a competitor of the dominant undertaking.[143] It appears, therefore, that tying is correctly characterized as requiring that customers be coerced to obtain the tied product from the dominant undertaking. However, it is

141. Microsoft II, *supra* note 91, at ¶¶ 19–22, 36.

142. *See* TFEU art. 102, *supra* note 12.

143. *See* Commission Decision 88/138, *supra* note 79, at 26, 28–29 (providing very clear examples in which the dominant undertaking withdrew discounts on the tying product when a customer did not buy it together with the tied product).

important to note that coercion in itself is a purely descriptive concept, which does not imply the existence of any market power and even less any anti-competitive effects. Coercion is a requirement for anti-competitive tying only because, if there is no coercion, there can be no tying. But if there is coercion, there is absolutely no inference that there might be a competition concern. The approach of the Commission in the Article 102 Guidance, which does not regard coercion as a separate element of the assessment of tying, is consistent with this analysis.[144] In a way, the absence of coercion may be considered a safe harbour: if there is no coercion, there can be no anti-competitive tying, but if there is coercion, further analysis is required to come to a conclusion as to whether the practice is anti-competitive.

The question of what amounts to coercion has given rise to some discussion in the case law although, in principle, it ought not to be controversial. In the online environment and, especially, in multi-sided markets, particularly interesting is the case in which the tied products are supplied for free. It is necessary to distinguish three scenarios:

(a) if the conduct of the dominant undertaking forces its rivals to distribute their products for free in order to stay on the market, there is no coercion and the practice cannot amount to tying. However, the practice may be predatory unless objectively justified;

(b) if a rational business model, which could have prevailed on the market under competitive conditions, entails suppliers distributing their product for free because they rely on other sources of revenue, for instance revenue from the sale of products complementary to the tied product or upgraded versions of the tied product,[145] there is no coercion. If an equally efficient competitor can rely on other sources of revenue, it is also unlikely that the conduct is predatory;

(c) if customers obtain the tied product for free, but they have no choice but to obtain it, there is coercion but not necessarily foreclosure. This is the approach of the Court of First Instance in *Microsoft I.* All the Court required was that the customers be coerced to obtain the tied product and not, in addition, that they be prevented from using rivals' products. This is clear from the

144. *See* Comm'n Guidance on Art. 102, *supra* note 1, at 16. It still describes tying as a practice that requires customers of one tying product to obtain the tied product. The use of the verb *require* demonstrates that coercion is still an element of the test but simply in that it distinguishes tying from other practices.

145. *See* Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶¶ 131, 137–38 (finding that other media players could be downloaded for free by the final user, including, in particular, certain basic versions of RealOne Player and QuickTime Player and iTunes).

Court's analysis of the U.S. settlement in which Microsoft had agreed to remove all icons and automatic points of access and to disable the default implementation of Windows Media Player. This arrangement did not allow customers to obtain the Windows client PC operating system without Windows Media Player and, therefore, did not invalidate the finding that customers were coerced to obtain the latter product.[146] In principle, this approach is correct, provided that coercion is properly understood as an element of the behaviour that triggers the application of the tying test and not as a form of anti-competitive effect. In other words, it is not an abuse to coerce customers to obtain the tied product. When customers are so coerced, however, it becomes relevant to assess whether as efficient competitors are foreclosed from the tied market. As will be explained below, this is possible even if customers do not pay for the tied product and are not prevented from using competing products. This was the case in *Microsoft I* where, once all Windows operating systems were tied with Windows Media Players, competitors could not resort to any other distribution channel to distribute their products.[147]

In *Android*, it is reasonably clear that OEMs wishing to obtain individual apps that are part of GMS cannot do so. Therefore, if OEMs wish to pre-install Play Store, there is coercion in obtaining the other apps that are part of GMS, and, in particular, Google Chrome and Google Search. Therefore, there is coercion in relation to the supply of Google Chrome and Google Search. However, coercion does not necessarily mean that the practice is abusive. It only means that it may be abusive. Clearly, there is coercion, within the meaning of the EU case law, in relation to endless examples of bundled products where any abuse would be inconceivable.

More complex is the problem of agreements between Google and manufacturers, whereby the latter agree to comply with minimum compatibility requirements for Android if they wish to pre-install GMS on their devices.[148] The Commission appears to take the view that this practice leads to the foreclosure of Android forks from the market. This arrangement is, on its face, different from a classic tying case. In both *Microsoft I* and *Microsoft II*, the dominant undertaking was tying its own proprietary software to its dominant operating system. In *Android*, the allegation is that Google would be preventing manufacturers from departing from

146. *Id.* at ¶¶ 972–74 (noting that Windows Media Player *reappeared* each time Internet Explorer was used to access media files streamed over the Internet).

147. *Id.* at ¶¶ 843–76, 1031–58.

148. A discussion of such agreements can be found in Körber, *supra* note 91, at 30–40.

minimum compatibility requirements for the Android open source operating system as a condition for licensing GMS even for devices that do not carry GMS. Therefore, OEMs can use Android versions other than that supplied by Google as long as they comply with the minimum compatibility requirements in the AFA.[149] It follows that there is no coercion to obtain a product supplied by the allegedly dominant undertaking because OEMs are able to obtain any AFA-compliant version of Android.

If one considers, correctly, that the tied product is any version of Android that meets the minimum compatibility requirements in the AFA, then there is coercion to obtain a product that may be, but is not necessarily, supplied by the dominant undertaking. If this amounts to coercion under Article 102(d), it is certainly coercion of a lesser degree that casts significant doubts on the capability of the practice to exclude equally efficient competitors from the market. In fact, the practice clearly does not exclude competitors that supply the same version of Android supplied by Google or competitors who supply different, improved versions of AFA-compliant Android. The practice only forecloses competitors who wish to supply non-AFA-compliant versions of Android. This differs from a tying practice where, once a customer is coerced to obtain a tied product from the dominant undertaking, in principle all as efficient competitors on the tied market are foreclosed unless they are able to deploy an effective counterstrategy to the distributional practice of the dominant undertaking.

F. Anti-Competitive Effect

1. The Requirement to Prove Foreclosure of As Efficient Competitors

In *Microsoft I*, the Commission accepted that it was necessary to prove that the tying of Windows Media Player with Windows client PC operating system had a foreclosure effect. However, the Commission was at pains to distinguish "classic tying cases,"

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149. *Android Compatibility*, ANDROID SOURCE, http://webcache.googleusercontent.com/search?q=cache:https://source.android.com/compatibility/index.html (last updated Nov. 15, 2017). It would appear that, as a condition to obtain a GMS licence, all OEM's Android devices (but, obviously, not devices running on other operating systems) would have to comply with the Android Compatibility Definition Document ("CDD") and pass the Compatibility Test Suite ("CTS"). As long as these requirements are met, OEMs are not prohibited from using any modified version of Android, and they generally do so. For example, it is very likely that each OEM would modify the user interface both for branding purposes and to provide for customized user experience. *See e.g.*, Eric Ferrari-Herrman, *Android UI Comparison: 2017 Edition,* ANDROIDPIT, https://www.androidpit.com/android-ui-comparison (last visited Apr. 23, 2018) (comparing the six major systems).

where the foreclosure effect would be "demonstrated by the bundling of a separate product with the dominant product" and the case of Microsoft, where "users can and do to a certain extent obtain third party media players through the Internet, sometimes for free."[150] The Court of First Instance appears to have endorsed such an approach, albeit only tentatively. On the one hand, the Court held that unilateral conduct infringes Article 102 only if it is capable of restricting competition.[151] On the other hand, the Court, in upholding the Commission's test and its conclusions on the facts, stressed that, normally, the Commission assumed that tying has, by its nature, a foreclosure effect.[152]

It is noteworthy, however, that the Court did not say that, in law, tying is presumed to have a foreclosure effect. The Court said that it was the Commission's practice to follow this approach. Nor are the distinguishing factors relied on by the Commission particularly convincing. The fact that customers can obtain the tied product from other suppliers, notwithstanding the dominant undertaking's tying practice, is not at all exceptional and applies in principle to all tying cases in which it is not technically impossible to use third party tied products with the dominant undertaking's tying product. The key question is always that of the incentives of the customers to switch to alternatives when they have already obtained the tied product from the dominant undertaking. But any analysis of customers' incentives is already an analysis of foreclosure because the focus will be on why the customer does not switch to an equally efficient supplier of the tied product. The circumstance that customers in *Microsoft I* could obtain the tied product "sometimes for free" is equally inconclusive as a distinguishing factor.

This is a recurring feature in multi-sided platforms where suppliers may provide a product for free to users on one side of the market because they are rewarded by the revenue generated on the other side of the market. Beyond multi-sided platform, the circumstance that customers can obtain the tied product for free may be an even stronger indication of anti-competitive effects as it might suggest that competitors are forced to give away their products for free in order to stay on the market. They may do so either in order to keep a presence on the market in the hope that the circumstances change in the short-to medium-term or because they are able to cross-subsidise their loss through the sale of complementary products. In either case, there is an anti-

150. Microsoft I, *supra* note 82, at ¶ 841.
151. Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 867.
152. *Id.* at ¶¶ 868, 1035–36.

competitive effect. In the former case, there is an anti-competitive effect because the dominant undertaking imposes a loss on its rivals that it does not incur itself, which is likely to exclude an equally efficient competitor from the tied market. In the latter case, there is an anti-competitive effect because it is an abuse for a dominant undertaking to force competitors to rely on a cross-subsidy in order to remain on a market, thus distorting the competitive process.[153] In any event, the question remains that of the incentives of the customers to obtain a competing product. In *Microsoft I*, both OEMs and final consumers had strong disincentives to install an additional media player on a PC.[154]

There are, therefore, strong arguments for the proposition that a finding of abusive tying invariably requires a finding of foreclosure. The idea that the Commission practice or the case law regards certain 'classic tying cases' as practices having the sole *prima facie* purpose of restricting competition thus giving rise to a *prima facie* case of abuse without a requirement to prove foreclosure is completely wrong.

In *Eurofix-Bauco v. Hilti*, the Commission made the following findings:

(a) The competitive significance of the markets for Hilti-compatible consumables was that, given Hilti's significant market shares, suppliers of consumables for nail guns generally would not be able to achieve the economies of scale necessary to compete effectively if they did not supply Hilti-compatible products;[155]

(b) Hilti had been able to limit severely effective competition from independent producers of Hilti-compatible nails;[156]

(c) Hilti had been able to preserve and strengthen its dominant positions on the markets for nail guns, Hilti-compatible cartridges, and Hilti-compatible nails. Hilti's strategy was to use its dominant positions on the markets where barriers to entry were highest, namely the markets for nail guns and Hilti-compatible cartridges, in order to reinforce its dominance on the market where it was most vulnerable, namely the market for Hilti-compatible nails;[157]

(d) The tying and other discriminatory policies against customers who bought only the tying product had "the object or effect of excluding independent nail makers who may threaten the dominant position Hilti holds";[158]

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153. *See* Case T-271/03, Deutsche Telekom AG v. Comm'n, 2008 E.C.R. II-00477, at ¶¶ 237–38.

154. Case T-201/04, Microsoft v. Comm'n, 2007 E.C.R. II-3619, at ¶¶ 1041–45.

155. Commission Decision 88/138, *supra* note 73, at 34.

156. *Id.* at 35.

157. *Id.* at 35–36.

158. *Id.* at 36.

(e) Tying was part of a wider exclusionary strategy.[159]

In *Hilti*, the issue of the foreclosure effect of the conduct under review was not raised before the EU Courts. It is clear, however, that the Commission had not only considered the exclusionary effect of the practice on stand-alone customers, but also the link between the tying and the protection of market power on the tying market and on the primary market for nail guns.

In *Tetra Pak II*, Tetra Pak was already dominant or in a leading position on the tied markets[160] and the Commission found that tying, and the other abusive practices under review in that case, aimed at eliminating any possibility of competition on the tied markets.[161] The 'elimination of any possibility of competition' on a dominated market or a market on which the undertaking has a leading position amounts to the maintenance or strengthening of market power on those markets. Before the Court of First Instance, Tetra Pak argued that the Commission found the tying of cartons to machines to be an infringement of Article 102 without considering whether these practices "had any real effect on competition."[162] The Court rejected this argument but not on the ground that tying is prohibited regardless of its effect on competition. On the contrary, the Court said that the tying clauses had to be appraised in the context of the other twenty-four contractual clauses under review, the "effect" of which was "an overall strategy aiming to make the customer totally dependent on Tetra Pak for the entire life of the machine once purchased or leased, thereby excluding in particular any possibility of competition at the level both of cartons and of associated products."[163] The Court went on to comment on the "object" of certain other clauses which "could" be considered abusive in themselves. Importantly, these clauses did not include the terms obliging customers to purchase only Tetra Pak cartons from Tetra Pak for use with Tetra Pak machines.[164] The Court of First Instance, therefore, considered that tying had an exclusionary effect. There may be doubts about the evidence that the Court considered sufficient to support this finding, but there can be no question that, in law, an exclusionary effect was held to be

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159. *Id.* at 36–38.

160. Commission Decision 92/163 of July 24, 1991, Relating to a Proceeding Pursuant to Article 86 of the EEC Treaty (IV/31043 – Tetra Pak II), 1991 O.J. (L 72), at ¶ 99–102 [hereinafter Tetra Pak II]; *see also* Case C-333/94, Tetra Pak Int'l S.A. v. Comm'n, 1996 E.C.R. I-5987.

161. Tetra Pak II, *supra* note 160, at ¶ 146, *aff'd,* Case T-83/91, Tetra Pak Int'l v. Comm'n, 1994 E.C.R. II-762, at ¶ 135.

162. *Id.* at ¶ 146; *see also* Case T-83/91 *supra* note 161, at ¶ 128.

163. Case T-83/91 *supra* note 161, at ¶135.

164. *Id.*

necessary in that case. The issue of anti-competitive effects did not arise on appeal before the Court of Justice.

In *Microsoft I*, the Commission relied on the following factors in order to establish foreclosure in the tied market:

(a) Given Microsoft's market share on the PC operating system market, the tying of Windows Media player with Windows operating system constituted a distribution practice, which ensured that Windows Media Player was as ubiquitous as Windows operating system. Consumers had no or low incentives to obtain a second media player providing similar functionality;[165]

(b) No other distributional practice was capable of offsetting Microsoft's advantage. OEMs did not have an incentive to enter into agreements with media player suppliers for the installation of an additional media player. The reduced hard disk capacity and the increased customer support costs were not justified by demand for a second product providing similar functionality to Microsoft's.[166] Nor could downloading be regarded as an efficient distribution practice because of many users' reluctance to download a second media player from the Internet. Furthermore, downloading as a distributional channel could not guarantee a given market share to any of Microsoft's competitors. Instead, the knowledge that Windows Media Player was on almost all PCs provided incentives for content providers and software developers to write their content and applications for it;[167]

(c) Bundling media players with other Internet services or software was less efficient and effective than tying because it could not guarantee the presence of the media player on a given number of PCs, which was key to providing incentives for content providers and software developers to write content and applications for it. Furthermore, such a distributional strategy could not achieve the same level of penetration as Microsoft's tying.[168] Retail

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165. Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶¶ 843–48.

166. *Id.* at ¶¶ 849–57.

167. *Id.* at ¶¶ 858–75.

168. *Id.* at ¶¶ 872–73. Doubt may be cast on some of the reasoning of the Commission on this issue. The Commission appeared to assume that only a distribution practice that guaranteed a competitor the same level of penetration as that of Windows Media Player would be sufficient to rebut the *prima facie* evidence of foreclosure. That was by definition impossible on the facts given the high market share Microsoft had on the tying market. The solution to this problem can perhaps be found in the indirect network effects evidence. Incentives for content providers and software developers depended on the guaranteed presence of Windows Media Players on most PCs. Once that was established, there were no or low incentives to write content and applications for other media players. See the discussion of indirect network effects below.

distribution was found to be costlier, to impose a transaction cost on consumers, and to require retailers to earn a margin by charging the end users.[169]

(d) The market was characterised by indirect network effects. Media players were platform software. Content providers and software developers developed content and applications for a given technology and faced increased costs in making their products compatible with more than one technology. There were, therefore, strong incentives to develop content and applications for the technology which had the widest presence on the market. This in turn raised a barrier to entry for non-compatible technologies. Even if a non-compatible media player were significantly better than Windows Media Player, as long as not enough content and applications were written for it, it would not be able to compete effectively on the market.[170]

(e) Increased market share on the tied market was likely to distort competition in complementary markets. In particular, the Commission examined the market for DRM technology, which is a technology used for the secure distribution of paid digital content over the Internet. Microsoft incorporated its own proprietary DRM technology into its media player and, in this way, was able to generate further indirect network effects which made any competitor wishing to offer DRM functionality dependent on obtaining a licence from Microsoft or else unable to compete effectively.[171]

(f) Microsoft significantly increased its market share of the tied market during the period of the infringement and there was a structural break in the market trend when Microsoft started to tie its media player to Windows.[172]

(g) The main competitor of Microsoft, RealNetworks, relied on revenue from licences of Real Player[173] and, as a consequence of Microsoft's conduct, was in a weaker financial position.[174] This was notwithstanding the fact that market literature and studies did not show that Windows Media Player had a competitive advantage over Real Player in terms of quality of the product.[175]

The Court of First Instance defined foreclosure as the effect "of affecting relations on the market between Microsoft, OEMs and suppliers of third-party media players by appreciably altering the

169. *Id.* at ¶ 876.
170. *Id.* at ¶¶ 883–96.
171. *Id.* at ¶¶ 897–99.
172. *Id.* at ¶¶ 900–44.
173. *Id.* at ¶ 945.
174. *Id.* at ¶ 953.
175. *Id.* at ¶¶ 949–51.

balance of competition in favour of Microsoft and to the detriment of the other operators."[176] The test the Court applied was whether tying had a negative effect on the structure of competition.[177] Only the first three elements of the Commission's analysis described above were held to be necessary to support the finding of foreclosure.[178] The analysis of indirect network effects and actual market developments were not.[179] The Court emphasised that the tying gave Microsoft a significant market penetration advantage, which was not based on competition on the merits,[180] and that without the anti-competitive tying the competition between Real Player and Windows Media Player "would have been decided on the basis of the intrinsic merits of the two products."[181] It also clarified that a foreclosure effect occurs not only when competitors are eliminated, but also when competition is weakened.[182] This analysis suggests that tying must be capable, at the very least, of excluding equally efficient competitors from the market. It matters not whether the actual foreclosed competitors are equally efficient than the dominant undertaking. What matters is that, if they were as efficient as the dominant undertaking, they could not have succeeded on the market, not because of the inferior quality of their products, their higher costs, or their mistaken business strategy, but because of the exclusionary practice of the dominant undertaking. As the exclusion does not result from a pricing schedule, the equally efficient competitor test does not require the application of price/cost analysis; however, the principle is the same. A competitor, with the same cost structure and a product of the same quality as Microsoft's, would not be able to compete effectively because of the inability to offset the advantages Microsoft enjoyed as a result of the tying.

In conclusion, it can hardly be said that the case law establishes or even supports the proposition that tying is a *per se* abuse.[183] In the only two cases in which the issue has so far arisen, namely *Tetra Pak II* and *Microsoft I*, the Court of First Instance clearly assessed whether the Commission had established that the practices under review had an exclusionary effect, whereas the

176. *Id.* at ¶1034.
177. *Id.* at ¶ 1054.
178. *Id.* at ¶¶ 1031–58.
179. *Id.* at ¶ 1059.
180. *Id.* at ¶ 1038.
181. *Id.* at ¶ 1046.
182. *Id.* at ¶ 1055.
183. *See* Thomas H. Au, *Anticompetitive Tying and Bundling Arrangements in the Smartphone Industry*, 16 STAN. TECH. L. REV. 188, 203–16 (2012) (discussing the *per se* rule vs. the rule of reason approach in tying cases in the smartphone industry under the Sherman Act).

Court of Justice has never ruled on the issue. This is consistent with post-Chicago theories of harm, which all require foreclosure and monopolisation of the tied market as a necessary (but not sufficient) condition of anti-competitive tying.[184] This is also consistent with the Commission Guidance on Article 102, which makes it clear that foreclosure leading to consumer harm is an element of the Commission's prioritisation exercise[185] and that, whether or not there is also an exclusionary effect on other markets, the exclusion of competitors from the tied market is invariably required.[186]

In *Android*, the alleged anti-competitive tying could be foreclosing as efficient competitors in general online search services or in the supply of licensable smart operating systems. In regard to general online search services, the Commission's objections would appear to be that by tying Play Store with Google Search and Google Chrome, the practice under review forecloses suppliers of competing general search services. The foreclosure of as efficient competitors must be specifically proven and cannot be presumed. There are two difficulties to proving foreclosure in this case. The first is that general search services are not exclusively performed through web browser and search apps. They are also performed through mobile (and desktop) browsers, as well as general search engines available on such browsers. But even assuming that web browser and search apps were the only way in which search services could be performed, the mere fact that Google Search and Google Chrome are pre-installed on certain smartphones would still be insufficient to prove foreclosure. The key question would be whether no other distributional practice is capable of offsetting Google's alleged advantage. In theory, any search or browser app supplier could enter into an agreement with OEMs to pre-install their apps on the devices by providing OEMs with valuable products for free, as Google does, or by making upfront payments, or by entering into revenue-sharing arrangements. The question is whether OEMs would have any incentive to enter into such agreements instead of, or in addition to, pre-installing GMS.

If Google is dominant on a potential market for Android-compatible app stores so that Google Play is a must-have product, then it would appear to follow that OEMs would not be able to pre-install other search or browser apps instead of GMS. Whether they

184. *See e.g.,* Carlton & Waldman, *supra* note 25; Choi & Stefanadis, *supra* note 25; Whinston, *supra* note 25.

185. Comm'n Guidance on Art. 102, *supra* note 1, at 9–10, 15–16.

186. *Id.* at 15.

would have any incentive of pre-installing additional search or browser apps in addition to GMS, it is not clear. Duplication of functionality could create confusion and occupies storage space unnecessarily. On the other hand, because Android is an open source operating system, anybody can supply an app store for Android. Competing search and browser app suppliers could bundle their apps with third-party app stores. If this is possible—and market evidence suggests that it may well be—[187] then any attempts by Google at competing, other than on the merits of its products, would be defeated.[188]

Furthermore, it would have to be explained why consumers have no or low incentives to obtain a second search app or browser app providing similar functionality to Google Search or Google Chrome. Compared to the facts in *Microsoft I* and *Microsoft II*, it would be necessary to verify whether it is still the case that consumers simply use pre-installed software or apps even if they are not of satisfactory quality and even if there are better products available on the market. Whereas in *Microsoft I* and *Microsoft II* downloading was not considered an efficient distributional practice, the conclusion may well be different in relation to smart devices where downloading apps is normal practice for consumers and the safety concerns or technical difficulties that consumers were believed to face in *Microsoft I* and *Microsoft II* are, in all probability, no longer relevant. Downloading today is an efficient distributional practice capable of offsetting the apparent advantage of pre-installation. Firstly, downloading today is very easy. The well documented success that certain apps such as, to name just one, Pokémon Go, achieve in a very short timeframe bears witness to that.[189] Secondly, pre-installation in no way discourages consumers from downloading their preferred apps, as demonstrated by the success of WhatsApp over Google's GMS pre-installed messaging app Hangouts, and of Dropbox over Google's

187. Samsung pre-installs its own app store on most of its devices. Amazon Appstore can be downloaded for free on any Android device. OEMs could pre-install these app stores on their devices and suppliers of search or web browser apps could bundle their apps with existing or new app stores. This strategy should be successful if Play Store were not competing on the merits, as there is nothing in the Android eco-system that allows Google to prevent competition, particularly given the absence of interoperability issues.

188. This analysis would appear to be incompatible with a dominant position by Google on a market for Android-compatible app stores but is also relevant to the assessment of anti-competitive effects. This should not come as a surprise, as dominance is not a separate step in the test for abuse detached from the inquiry into the anti-competitive effects of a practice.

189. *See, e.g.*, Randy Nelson, *Mobile Users Are Spending More Time in Pokémon GO Than Facebook*, SENSOR TOWER (July 12, 2016), https://sensortower.com/blog/pokemon-go-usage-data.

GMS pre-installed file-sharing app Drive.[190] Nor do consumers any longer feel 'locked into' the default settings of their smart devices. The Canadian Competition Bureau, in its statement closing an investigation into allegedly anti-competitive practices by Google, recognized that "consumers can and do change the default search engine on their desktop and mobile devices if they prefer a different one to the pre-loaded default."[191]

In regard to the foreclosure of suppliers of Android forks, indirect network effects would appear to be much less relevant in *Android* than they were in *Microsoft I* and *Microsoft II*. Because Android is an open source operating system, interoperability issues are much less pronounced than in other digital eco-systems. The foreclosure of Android forks is, therefore, a much less plausible strategy than the foreclosure of competing media player and internet browser suppliers were in *Microsoft I* and *Microsoft II*, respectively. More importantly, from the publicly available information on the case it would appear that Google does not require OEMs to use only Google's own version of Android. Even when they sign an AFA, it would appear that OEMs remain free to use any available version of Android provided that it complies with minimum compatibility requirements. Proof of exclusion of as efficient competitors would, therefore, require identifying what better or more innovative features of Android are prevented from emerging because of the allegedly anti-competitive conduct. This more exacting standard is required because, *prima facie*, the practice under review is incapable of excluding equally efficient competitors: suppliers of versions of Android that are the same as that supplied by Google are, by definition, not foreclosed. Even more strikingly, suppliers of different, customised and, potentially, improved versions of Android are also not foreclosed. The only foreclosed competitors are those who wish to supply versions of Android that do not comply with the AFA requirements. It is, therefore, necessary to demonstrate why the foreclosure of this subset of competitors, or potential competitors, caused harm to competition. Such a harm cannot simply be presumed or inferred but, conceivably, could only consist in the prevention of the emergence of better or innovative features of Android that are

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190. Dropbox, it appears, has been downloaded more than half a billion times on Android. Bertel King Jr., *Dropbox Android App Passes 500 Million Installs on Google Play*, ANDROID POLICE (Jan. 25, 2016), https://www.androidpolice.com/2016/01/25/dropbox-android-app-passes-500-million-installs-on-google-play/; *see also Dropbox*, GOOGLE PLAY, https://play.google.com/store/apps/details?id=com.dropbox.android&hl=en (last visited Apr. 23, 2017).

191. *Competition Bureau Statement Regarding its Investigation into Alleged Anti-Competitive Conduct by Google*, COMPETITION BUREAU (Apr. 19, 2016), http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04066.html.

incompatible with the AFA requirements for which there is actual or potential consumer demand.

2. Acquisition, Maintenance or Strengthening of Market Power on An Affected Market

The post-Chicago literature shows convincingly that a dominant undertaking may have an incentive to tie in order to protect or strengthen its market power on the tying market, to acquire or protect market power on the tied market, or to acquire market power on a related emerging market.[192] In the absence of such an incentive, tying is likely to be pro-competitive. Therefore, there is a strong case for requiring proof of likely maintenance or strengthening of market power on the tying market or acquisition, maintenance, or strengthening of market power on the tied market or on a related market. The Commission Guidance on Article 102 adopts the right approach to tying by requiring proof of anti-competitive foreclosure, namely foreclosure leading to consumer harm.[193] It also adopts the right approach when it states that "tying or bundling may lead to anti-competitive effects in the tied market, the tying market, or both at the same time."[194] There is no mention of the possible effect on a third related market but, since the Guidance is not a statement of the law, this omission is not conclusive.

The Commission decisional practice in tying cases has consistently been to examine the likely maintenance or strengthening of market power on the tying market or acquisition, maintenance, or strengthening of market power on the tied market or on a related market; whereas, to the limited extent that the issue has arisen before the EU Courts, the latter have been less clear in setting out this requirement as an element of the tying test.

The protection of market power on the tying market as a theory of harm is already present in *Tetra Pak II*, where the Commission found that by tying cartons to machines, Tetra Pak foreclosed competition for cartons because these were the markets in which Tetra Pak was more vulnerable to competition. The Commission explained that "Tetra Pak thus artificially limits competition to the area in which its position is strongest because equipment, in particular aseptic equipment, is the area in which its technological

192. See the discussion on the post-Chicago literature *supra*.
193. Comm'n Guidance on Art. 102, *supra* note 1, at 9–10, 15–16.
194. *Id.* at 15.

lead is greatest and entry barriers are at their highest."[195] While the analysis of the strategic aims of Tetra Pak is not clearly articulated, it is noteworthy that many years before the seminal Carlton and Waldman paper on tying as a means of protecting a monopoly in the tying market,[196] the Commission had, on the facts of one of the leading EU tying cases, came close to describing this type of strategic conduct. Unfortunately, the issue did not arise before the Court of First Instance, which held the tying clauses to be abusive as part of an overall exclusionary strategy but also "in themselves."[197]

In *Microsoft I*, the Court's ruling upholding the Commission decision of anti-competitive foreclosure is only supported by the very large market share of Microsoft on the tying market, the tying itself, and the inability of competitors to obtain the same level of market penetration through other channels of distribution. Tying gave Microsoft a commercial advantage consisting of increased market share on the tied market, which was not the result of the superior quality of its product.[198] This is a finding that the tying excluded equally efficient competitors. The Commission had gone further, particularly in the analysis of indirect network effects and actual foreclosure. Microsoft had an incentive to exclude because the market would have tipped at some point, giving it substantial market power on the media player market protected by high entry barriers created by the anti-competitive conduct itself. But why did Microsoft have an incentive to do so? The Commission identified two reasons.[199] The first was the protection of Microsoft's market power on the client PC operating system market. Media players could be used as platforms for "limited purpose" programmes such as media applications calling upon the application programming interfaces exposed by media players.[200] A development of this model to "general purpose" applications would pose a threat to Windows as the dominant PC operating system, as applications could run on media players regardless of the underlying operating system.[201] Media players in conjunction with Java technologies could already significantly reduce the importance of the operating system. By foreclosing the media player market, Microsoft

195. Tetra Pak II, *supra* note 160, at ¶ 146(3); *see also* Case C-333/94, Tetra Pak Int'l S.A. v. Comm'n, 1996 E.C.R. I-5987.

196. Carlton & Waldman, *supra* note 25 *passim*.

197. Case T-83/91, Tetra Pak Int'l S.A. v. Comm'n, 1994 E.C.R. II-762, at ¶ 135.

198. *See* T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, ¶¶ 1031–59.

199. *Id.* at ¶¶ 971–77.

200. *See* Microsoft I, *supra* note 82, at ¶ 972.

201. *See id.*

protected its dominant position on the operating system market.[202] Furthermore, Microsoft's monopolisation of the media player market would increase the barriers to entry to the operating system market because it would force a potential entrant to offer a Microsoft-compatible media player.[203] The issue did not arise on appeal as the Court of First Instance considered that foreclosure on the tied market was sufficient for a finding of anti-competitive effect.[204] The second was the acquisition of market power on emerging markets. The monopolisation of the media player market allowed Microsoft to gain a "significant advantage in other business areas such as those for content encoding software, format licensing, wireless information device software, DRM solutions and online music delivery."[205] The issue was, unfortunately, not explored on appeal. The Court of First Instance simply noted that Microsoft had not disputed this finding,[206] but the Court did not consider that it was necessary to support the conclusion of anti-competitive effect. Foreclosure of the tied market was sufficient.[207]

In *Microsoft II*, the Commission preliminarily concluded that the tying of Microsoft's web browser Internet Explorer to Windows was a strategy to preserve Microsoft's dominant position on client PC operating systems. Web browsers allowed client applications to run in a web-based setting rather than on the PC operating system. For instance, a word processing application could run on a web browser without reducing functionality and user experience. This would make PC operating systems, the product over which Microsoft has a quasi-monopoly, less and less important. By tying Internet Explorer to Windows, Microsoft ensured that Internet Explorer became the *de facto* standard for web applications and content. If Internet Explorer was functionally different from other web browsers, applications and content written for Internet Explorer would not run, or not run as smoothly, on other web browsers. This would lock consumers into Internet Explorer. To the extent that Internet Explorer was only available on, or compatible with, Windows, end users would be indirectly locked into Windows, which was Microsoft's core business.[208] In *Microsoft II*, Microsoft's monopolisation of the web browser market could also have been motivated by the leverage of market power to the

202. *See* T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶¶ 952, 972. For an explanation of the functionality of "Java technologies" see Microsoft I, *supra* note 82, at ¶ 43.

203. T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 974.

204. *See id.* at ¶¶ 1031–90.

205. Microsoft I, *supra* note 82, at ¶ 975 (footnotes omitted).

206. T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 1076.

207. *Id.* at ¶ 1058.

208. Microsoft II, *supra* note 91, at ¶¶ 57–58.

emerging service markets, which were associated with Web 2.0. These markets comprised external marketing functions (from banking to social networking) and internal collaboration functions (from information sharing to project management within an organisation) and required applications that run on web browsers. While this theory of harm was not developed in the commitments decision, it would appear to be plausible on the facts.

In *Android*, the Commission's theory appears to be that Google is foreclosing the market for general online search services and for licensable operating systems for smart devices. What is Google's incentive to do so? And, if foreclosure is indeed likely, how would this harm long-term social welfare?

The incentive to foreclose the market for general online search services would arise from the increased profits that Google would make on the advertising side of the market. As competitors are foreclosed from offering general search services to users, Google will face less competition for online advertisement and would therefore be able to obtain supra-competitive advertising rates. As rivals are deprived of advertisement business, they would be further marginalised on the search side on the market, so that Google would then be able to degrade the quality of its own search services and innovate more slowly than it would have done on a competitive market. Thus, Google's incentive to tie Google Search and Google Chrome with Play Store rests on the idea that it is possible to monopolise the general search market. However, a degradation of the quality of general online search services should, in principle, lead consumers to use alternative search engines or alternative ways of searching the internet. If this happens, then Google's attractiveness to advertisers would diminish and this would lead to lower advertising rates or less advertisement being placed on Google. The alleged tying abuse thus requires proof that either: (1) consumers would not react to a degradation of the quality of search services, or (2) there are no adequate actual or potential alternatives to Google search services on the market for internet search services. The competitive harm would then consist in the lowering of the quality of general online search services and the restriction of output on the advertising side of the market.[209]

The incentive to foreclose the market for licensable smart operating systems is even less clear. Android is licensed for free, therefore the incentive to foreclose could not consist in the

209. For an analysis of possible competitive harm in online search services, see R. Nazzini, *Unequal Treatment by Online Platforms: a Structured Approach to the Abuse Test in Google in* THE NOTION OF RESTRICTION OF COMPETITION: REVISITING THE FOUNDATIONS OF ANTITRUST ENFORCEMENT IN EUROPE 281–308 (D. Gerard, et al., eds., 2017); Nazzini, *supra* note 113 at 301.

acquisition, maintenance or strengthening of market power on the tied market. A possible incentive could be that by preventing the emergence of successful Android forks, Google protects its market power on the alleged market for app stores for Android because Android forks could be platforms for launching or increasing the market presence of app stores alternative to Google Play. On the market for app stores for Android, Google would be able to raise the commission charged to app developers above competitive levels. This could restrict the supply of apps and, possibly, degrade their quality. Furthermore, by maintaining its market power on the market for app stores for Android, Google would retain its ability to use Play Store as a tying product for Google Search and Google Chrome, thus preserving or increasing its market power in online search and online advertising. Under both theories of harm, a necessary condition to the alleged tying abuse is that there is a market for app stores for Android that it is possible to monopolise.

To establish a *prima facie* case of anti-competitive tying, it would be necessary to prove that there are barriers to entry or expansion on the market, such that if Google did raise the commission for apps for developers thus also raising the price of apps and reducing their number and quality for consumers, no other undertaking could successfully supply an app store for Android so as to make the anti-competitive strategy unprofitable. This may not be so obvious, given that Android is an open source system, and anybody could supply an app store and apps for Android and, as previously shown, there are already several app stores for Android that compete with Google Play. Finally, the incentive to foreclose the market for licensable smart operating systems could be that Android forks are more likely to carry competing search or browser apps. This theory of harm presupposes that there is an online search market that is possible to monopolise and requires proof of the same conditions discussed above in relation to the incentive to foreclose the market for general online search.

In conclusion, proof of likely acquisition, maintenance, or strengthening of market power on an affected market is capable of playing a fundamental role in the assessment of tying: that of safeguarding against the risk of false convictions and over-deterrence. The exclusion of an as efficient competitor should not necessarily give rise to an inference of abuse in and of itself when the anti-competitive effects of the practice under review are not clear-cut. EU law does adopt this approach in relation to other abuses. This is the case, for example, of predation at prices above average variable costs ("AVC"). Thus, in *AKZO*, the Court of

Justice held that prices below average total costs ("ATC") were capable of excluding an equally efficient competitor if part of an anti-competitive strategy.[210] In *France Télécom*, the Court of Justice held that recoupment, as incentive to predate, could be relevant evidence of an anti-competitive strategy.[211] The requirement that, if prices are above AVC but below ATC, proof of an anti-competitive strategy is a necessary element of the predation test, can be explained as follows: prices above AVC but below ATC can exclude an as efficient competitor. They could also, however, be competition on the merits. Therefore, something more than the mere likelihood of foreclosure is required, namely proof of an anti-competitive strategy. Since tying is also capable of excluding an equally efficient competitor, but is also consistent with competition on the merits, by analogy with the case law on predation, proof of an anti-competitive strategy should also be required. Proof of acquisition, maintenance, or strengthening of market power on an affected market is relevant to establishing an anti-competitive strategy and, in the absence of other substantially probative and consistent evidence,[212] should be necessary to establish a *prima facie* case of anti-competitive tying.

V. DEFENCES

A. General

It is well established that tying may generate significant efficiencies or pursue other legitimate objectives, such as the preservation of the producer's goodwill, quality assurance, and ensuring compliance with safety requirements. Under Article 102, any legitimate commercial or non-competition objective may be pleaded in rebuttal to a *prima facie* case of anti-competitive tying or substantiate an objective justification provided, in the latter case, that the tying is suitable to achieving the objective, it is the least restrictive means of doing so, and the benefits of the tying outweigh its anti-competitive effects.[213]

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210. Case C-62/86, AKZO Chemie BV v. Comm'n, 1991 E.C.R. I-3439, at ¶ 72.

211. Case C-202/07, France Télécom S.A. v Comm'n, 2009 E.C.R. I-02369, at ¶ 111.

212. Such evidence was perhaps present in Case T-83/91, Tetra Pak Int'l S.A. v. Comm'n, 1994 E.C.R. II-762, at ¶ 135, where tying was part of a wider strategy including, but not limited to, predatory pricing: *See id.* at ¶ 20.

213. On the distinction between mere rebuttals and objective justification defences, see NAZZINI, *supra* note 4, at 287–89, 300–21. Briefly, mere rebuttals are defences that do not plead a new primary fact but simply challenge the inference of abuse drawn under a *prima facie* test either by adducing new evidence or disputing the weight or probative value of the evidence adduced by the competition authority or claimant. Objective justification is a defence that pleads a new primary fact from which consequences are drawn that are

The following sections discuss the categories of objective justification defences that have been examined in the case law or were potentially relevant to the tying cases decided under Article 102. They include:

1. Economies of scope in production and distribution;
2. Reduction in transaction costs;
3. The preservation of the producer's goodwill, quality assurance, and ensuring compliance with safety requirements;
4. Standardisation; and
5. Dynamic efficiency.

B. Economies of Scope in Production and Distribution

The cost of producing two products together may be lower than the sum of the costs of producing each of them separately. However, the fact that joint production generates efficiencies does not necessarily imply that the products in question must be distributed together.[214] It would appear, therefore, that, while economies of scope in production are certainly a legitimate objective dominant undertakings are allowed to pursue under Article 102, joint distribution by tying is generally not suitable to achieving the objective.[215]

Tying, however, can be used to achieve economies of scale in distribution. The cost of distributing two products together may be lower than the cost of distributing each product separately. This is clearly a legitimate objective that a dominant undertaking is allowed to pursue, and tying appears to be suitable to achieving the objective because it causes the customer to obtain the two products together. The question is whether these practices are the least restrictive means of achieving the objective.[216] It must be recalled that objective justification only becomes relevant if it has already been established that: a) the undertaking concerned is dominant on the tying market; b) there are structural features of the tied market that give the dominant undertaking the ability and incentive to exclude equally efficient competitors by tying; c) the tying has the likely effect of excluding equally efficient competitors from the tied market; and d) the tying is likely to

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incompatible with a finding of abuse under Article 102. Section V of this paper focuses on objective justification.

214. Kai-Uwe Kühn et al., *supra* note 4, at 107.

215. See, however, the Commission Guidelines on Vertical Restraints, 2010 O.J. (C 130) 1, 44–45, which treat joint production and joint distribution the same, without distinguishing between the two.

216. NAZZINI, *supra* note 4, at 312.

contribute to the strengthening, maintenance, or acquisition of the market power of the undertaking concerned on an affected market. It appears, therefore, that if there are economies of scope in distributing two different products together, the same objective can be achieved by a multi-product rebate, whereby the incremental price of each product is above its long-run average incremental cost ("LRAIC"). Such a rebate is unlikely to be exclusionary. At the same time, it is likely to be equally effective as the tying to realizing economies of scope because it passes on any cost-saving to the consumers. Consumers will buy the bundle if their valuation of it exceeds or equals its cost. This analysis does not apply when the bundled products are supplied for free. Thus, in *Android*, it appears that OEMs did not pay separately for GMS or for the individual apps that are included in GMS. If this were indeed the case, economies of scope cannot be achieved equally effectively by a multi-product rebate. It will then be necessary to assess whether the benefits of the tying outweigh its negative effects. The analysis is highly fact-sensitive, and no clear-cut rules may be provided. The two elements of the balancing exercise are: a) the additional cost savings in distribution that can only be achieved through tying; b) the likely harm to long-term social welfare and productivity caused by the exclusion of as efficient competitors from the tying market, leading to the strengthening, maintenance, or acquisition of market power by the dominant undertaking on an affected market.

C. Reduction in Transaction Costs

Because customers are coerced to obtain two products together, tying reduces transaction and search costs. This is a legitimate objective of tying and tying is clearly suitable to achieving the objective. An exception is when final consumers benefit from an integrated bundle, but the tying occurs on an intermediate market.[217] In *Microsoft I*, the Court of First Instance said that "consumer demand for an 'out-of-the-box' client PC incorporating a streaming media player can be fully satisfied by OEMs, who are in the business of assembling such PCs and combining, inter alia, a client PC operating system with the applications desired by consumers." [218] In *Microsoft II*, the tying of Internet Explorer with Windows was also occurring at the level of the OEMs. The reduction of transaction costs for consumers could have been achieved by OEMs offering the final consumers the bundles they

217. *Id.* at 309–10.
218. Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 1155.

valued, including bundles of Windows and non-Microsoft web browsers. This appears to be an application of the suitability test: tying on an intermediate market is not suitable to reducing transaction costs on the final market if the intermediate resellers of the tying and the tied products could themselves assemble integrated bundles under competitive conditions. The bundle does not have to be imposed by the dominant undertaking. However, it is a question of fact whether intermediate undertakings are as well placed as the dominant undertakings to bundle. In *Microsoft I* and *Microsoft II,* and now in *Android*, it is questionable whether OEMs are as well placed as Microsoft and Google in selecting the elements of the bundle in order to provide consumers with an "out-of-the-box" solution.

If the tying is suitable to achieving the reduction in transaction costs, the question is whether there are less restrictive means of achieving the objective and whether the benefits of the practice outweigh its negative effects. Generally, it would appear that mixed bundling is a less restrictive alternative to tying. Provided that the incremental price of each component is not below its LRAIC, consumers would have the choice of buying the bundle, thus saving transaction and search costs, or buying two stand-alone components. In *Microsoft I*, consumer demand for an integrated operating system with media functionality did not justify the tying of Windows and Microsoft Media Player because the Commission decision did not "prevent Microsoft from continuing to offer the bundled version of Windows and Windows Media Player to consumers who prefer that solution."[219] While the Court did not apply the proportionality test in a structured way, this appears to be an application of the less restrictive means test: the same objective of offering an integrated solutions to those who prefer it can be achieved by mixed bundling. Tying is not required. Similarly, in *Microsoft II*, a possible justification for the tying of Windows with Internet Explorer was that users benefited from having a web browser pre-installed on their PC. This saved them the transaction costs of selecting and installing a web browser themselves. There was, however, again, a less restrictive means of achieving this objective: offering a mixed bundle that allowed customers to choose whether they wanted an integrated system or stand-alone products. In *Android*, in principle, Google could offer its proprietary apps separately and as a bundle, leaving OEMs free to choose whether to opt for the bundle or for only some of the individual apps. However, if it did so, Google would have to set a price for Play Store when it is supplied alone. This would raise the

219. *Id.* at ¶ 1155.

cost of Play Store for OEMs and would deprive them, as well as consumers, of the benefit of an "out-of-the-box" device. OEMs could of course assemble a bundle of apps themselves, but the cost of doing so would be higher (because, as explained, Google would charge for Play Store).

If there is no less restrictive alternative to tying, then it is necessary to balance its benefits against its negative effects. This balancing act may be particularly difficult when the tying occurs at retail level and the customers are unsophisticated consumers. When, however, the tying occurs on an intermediate market or the customers are sophisticated and well-informed consumers, it is unlikely that the savings in transaction costs outweigh the anti-competitive harm of tying.

D. Preservation of Interoperability and Goodwill, Quality Assurance, and Ensuring Compliance with Safety Requirements

Tying may be a way of preventing customers from using, in conjunction with the dominant undertaking's primary products, complementary products that may reduce the performance of either product or the system as a whole, or may give rise to the risk of faulty performance, or pose safety hazards. In *Hilti*, the Commission argued that a dominant undertaking was not entitled to prevent the use of complements in conjunction with its own products, even if there was a genuine safety concern.[220] The Court of First Instance accepted this argument. It held that Hilti could not rely on a duty of care arising under national product liability law, because national law could not take precedence over EU law.[221] More problematic is the case in which the dominant undertaking ties complements and primary products because the use of other complementary products would impair the performance of the system, cause faults, or even pose a safety risk. The Court of First Instance in *Hilti* held that, when there are public authorities entrusted with the enforcement of rules on the sale of dangerous products and misleading advertising, the dominant undertaking is not allowed to take unilateral measures to ensure the safety of its own products.[222] Instead, it must request the intervention of the competent public authorities,[223] which would result in an impartial adjudication of the dispute. It is

220. Case T-30/89, Hilti AG v. Comm'n, 1991 E.C.R. II-1441, at ¶ 98.
221. *Id.* at ¶ 119.
222. *Id.* at ¶¶ 115–18.
223. *Id.*

difficult to agree with this conclusion. This part of the judgment was not appealed to the Court of Justice,[224] but such an appeal would have succeeded on the ground of the complete failure of the Court of First Instance to state the reasons for its decision. In any event, the Court did not rule that safety was not a legitimate objective that a dominant undertaking was allowed to pursue. The focus was on the way in which this objective should be pursued. Therefore, the Court was probably applying the test of reasonableness and proportionality by pointing out that there were less restrictive means of achieving the objective. This judgment is, however, fact-sensitive and does not mean that, in law, safety concerns, interoperability, quality assurance, and preservation of goodwill cannot be a valid objective that a dominant undertaking is entitled to pursue.[225]

In *Android*, Google's practice of requiring minimum compatibility standards for Android for devices that carry GMS as a condition for the licensing of GMS clearly serves the legitimate objective of ensuring that Google's apps run smoothly on the device. Specifying certain compatibility standards for Android is clearly a suitable means to achieving such an objective. Provided that the compatibility standards required by Google are limited to those necessary to ensure that Google's apps run smoothly on the device and Google's brand image and goodwill are protected, there are also no less restrictive means of achieving the objective and, finally, it would appear that the efficiencies do outweigh any anti-competitive effects of the practice. The question is whether requiring minimum compatibility standards for devices that do not carry GMS is also justified (assuming, of course, that it is *prima facie* anti-competitive in the first place). The objective pursued by such a practice appears to the preservation of the integrity of the Android ecosystem, avoiding its fragmentation and, therefore, a degradation of the user experience. This would harm Android as an open source system and cause demand to shift to proprietary operating systems. Protecting the integrity of the Android ecosystem and user experience preserves or strengthens demand for compatible Android apps, including GMS, and lowers Android developers' costs. These objectives can be described as the preservation of interoperability and quality assurance and, as such, they appear to be legitimate under Article 102. The AFA is certainly suitable to achieving the objective. However, are there less restrictive means to doing so? The question is what would be likely to occur absent the AFA, given the compatibility

224. *See* Case C-53/92, Hilti AG v. Comm'n, 1994 E.C.R. I-693.
225. NAZZINI, *supra* note 4, at 317–21.

requirements that it sets out. If, in the counterfactual, there would be a significant risk of fragmentation of Android leading to lack of interoperability and degradation of user experience, then the AFA would probably be the least restrictive means to achieving the objective, bearing in mind that it does not forbid any modifications to Android, but only those modifications incompatible with certain requirements. If the AFA is the least restrictive means of achieving the objective, then its benefits would have to be balanced against any anti-competitive effects.

E. Dynamic Efficiency

Two products may perform better together than if used with other complements. Over time, two products may become so closely associated in the eyes of the consumer, that they become a unitary product because no significant number of consumers would require the functionality of either component without the other's. This may be achieved when two components are technically integrated. Improved technical performance and the development of a new, integrated product are forms of dynamic efficiency that are without any doubt legitimate objectives under Article 102. In *Microsoft I*, Microsoft put forward a number of arguments to the effect that unbundling Windows and Windows Media Player would result in lower performance or a degradation of the system.[226] The Court rejected those arguments for lack of evidence, but accepted, implicitly, that, if substantiated, they could have constituted a valid objective justification.[227]

Technological tying appears to be suitable to achieving superior integrated performance or developing a new integrated product. Technological tying, however, must be the least restrictive means of achieving the objective. In order to satisfy this limb of the proportionality test, technical integration must not be the result of a deliberate choice of the dominant undertaking to design complementary products that can only operate optimally together. This would be no more than a commitment to tying that enhances rather than reduces the anti-competitive effects of the practice in question.[228] Therefore, tying must be the result of a genuine technological constraint so that the same result cannot be achieved by mixed bundling, or specifying minimum standards, or requirements for the tied product.

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226. *Id.*

227. Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶¶ 1160, 1163–66.

228. Comm'n Guidance on Art. 102, *supra* note 1, at 15.

Tying may also be a legitimate way of funding significant innovative efforts. In *Android*, Google developed Android as an open source operating system, which is free for all to use. The benefits for the industry at a global level have been significant, opening up competition and innovation in the smart device sector. The way in which Google is rewarded for its investment in Android is to raise revenue from Play Store as well as from certain key apps such as Google Search and Google Chrome. This is certainly a legitimate objective. Tying Play Store with Google Search and Google Chrome is also clearly suitable to achieving such an objective. The question is whether there are less restrictive means of doing so (for example by simply supplying the three apps separately) and, if there are no less restrictive means, whether the anti-competitive effects of tying outweigh its pro-competitive effects. In this balancing exercise, it must be borne in mind that dynamic efficiency is the most important driver of long-term productivity and social welfare, which are the key objectives of Article 102. Provided that tying produces genuine and not insubstantial benefits in terms of product improvement or development of a new product, at the very least the importance of these benefits under Article 102 should give rise to a presumption that dynamic efficiency prevails over the anti-competitive harm of tying.[229]

F. Standardisation

Tying may produce benefits in terms of standardisation. Standardisation may have several benefits, including ensuring the interoperability of complementary products, reducing costs, and ensuring minimum quality requirements. While standards may be developed through horizontal cooperation or imposed by public authorities, tying may also result in a *de facto* standardisation.

The issue arose in *Microsoft I.* Microsoft claimed that the tying of Windows and Windows Media Player allowed software developers and content providers to write their software and applications for a single platform without incurring the extra cost of ensuring that their products could run on a number of different streaming media players.[230] The Court rejected this argument on three grounds:

1. The standardisation of media player technology on the media player market was precisely one of the sources of the anti-

229. NAZZINI, *supra* note 4, at 315–16.

230. Case T-201/04 Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 1151.

competitive effects of the tying.[231] Although the Court did not go as far as saying that standardisation achieved by the unilateral conduct of a dominant undertaking can never be a legitimate objective under Article 102, there are clearly conceptual difficulties in accepting that the source of the anti-competitive effect is, at the same time, a relevant benefit under Article 102. However, the proportionality test under Article 102 requires not only that the objective be a legitimate one, but also that the conduct be proportionate to the achievement of the objective.[232] The better view seems to be that when a benefit is, in principle, capable of increasing social welfare and productivity in the long-term, it is a legitimate objective under Article 102. So is standardisation. The fact that standardisation is the source of the anti-competitive effect is not an obstacle to this conclusion. The very purpose of the objective justification test is to ascertain whether conduct that is *prima facie* abusive is, in fact, beneficial. The question is whether the other limbs of the proportionality test are met.

2. Standardisation, while beneficial in certain circumstances, "cannot be allowed to be imposed unilaterally by an undertaking in a dominant position by means of tying."[233] The Court, therefore, implicitly held that cooperative standardisation or standardisation resulting from an effective competitive process, absent the exclusionary tying, is a less restrictive alternative to unilateral standardisation. This principle is probably true in most circumstances. Cooperative or competitive standardisation is more likely to result in the most efficient standard being adopted rather than in the standard imposed by a dominant undertaking through the leveraging of its market power. Furthermore, even cooperative standardisation, which may entail a restriction of competition justified under Article 101(1), may be less anti-competitive than unilateral standardisation because it allows different competing standards to be assessed and selected based on the merits of each candidate standard.[234]

3. Although the widespread presence of Windows Media Player may have advantages for software developers and Internet site developers, "that cannot suffice to offset the anti-competitive effects of the tying at issue."[235] The Court, therefore, held that the balancing of the benefits of tying against its anti-competitive

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231. *Id.* at ¶ 1151.

232. *See* Comm'n Guidance on Art. 102, *supra* note 1, at 28–31.

233. *Id.* at ¶ 1152.

234. *See* Commission Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-operation Agreements, 2011 O.J. (C 11) 1, 55–72 [hereinafter Guidelines on Horizontal Co-operation Agreements].

235. Case T-201/04, Microsoft Corp. v. Comm'n, 2007 E.C.R. II-3619, at ¶ 1151.

effects clearly showed that the anti-competitive effects outweighed the benefits.[236] This balancing test is fact-sensitive, and no general rule can be distilled from a single case. It cannot be excluded that the benefits of standardisation, for instance in terms of allowing market interpenetration, interoperability, and follow-on innovation, including by firms that are not dependent on the dominant undertaking, are very substantial. If they are, they may well outweigh the anti-competitive effects of the tying on the facts of a particular case.

In *Android*, one alleged objective of the requirement that OEMs comply with certain minimum compatibility standards for Android is to avoid the risk of fragmentation of the system. Android was developed by Google as an open source system. It is licensed for free and anybody can modify and improve it. This allows app developers to create apps that run on many devices and do not have to be specific for each carrier. Clearly, the benefits are significant. The cost of developing apps is lower and their availability and potential distribution wider. OEMs can use a free operating system with a large number of compatible apps. Consumers benefit from increased competition in the smart device sector and from the large number and low cost of apps available for Android. However, these benefits would be lost if Android degenerated into a number of different, incompatible operating systems. The cost of developing apps would rise as the same app would not run equally smoothly on all Android devices. The number of apps for each Android fork would probably be lower and their cost higher than under a more standardised ecosystem. Google's practice of requiring minimum compatibility standards for Android has the objective of preserving the benefits of a standardised open source system and preventing its fragmentation. This practice is different from standardisation imposed by tying by the dominant undertaking, as in *Microsoft I*.

In *Microsoft I*, Windows Media Player was not an industry standard to start with. Microsoft argued that tying itself would have made Windows Media Player the industry standard. Thus, the industry standard would have been imposed by the anti-competitive practice and not selected by the market. There were probably less anti-competitive means to achieve standardisation. In *Android*, Android was not an industry standard as it coexists with at least another major operating system: Apple's iOS. Furthermore, its current widespread acceptance by the industry is not the result of any anti-competitive practice but of its quality and its open source character. The alleged anti-competitive

236. *See* Guidelines on Horizontal Co-operation Agreements, *supra* note 234.

conduct would prevent the benefits achieved in the industry from being lost to fragmentation. The objective pursued is clearly legitimate and the means applied are suitable to achieving the objective. Are there less restrictive means of doing so? It is not clear that there are. From the publicly available information, it appears that Google does not impose restrictions in its licence of Android to OEMs. Any OEM is free to take a licence of Android and modify it as it pleases. Restrictions are only imposed if an OEM also takes a licence of the GMS. Thus, significant degree of OEMs' choice is preserved. If newer, better versions of Android were available on the market, OEMs could use them and opt to use app stores other than Play Store or develop their own.[237] But if OEMs make the independent commercial decision of installing GMS on their devices, then Google takes this opportunity to require them to avoid excessive fragmentation of Android.

It is not obvious that, other than imposing conditions in its Android licence, which would be more restrictive, there are other ways in which Google could take steps to achieve its objective. The less restrictive means test would then require considering whether the compatibility standards in the AFA are themselves the minimum which is required to achieve the objective. However, competition authorities and courts should not second guess industry practices and impose their own view on technical judgments made by undertakings active in the market. In the words of the Commission, they should only intervene "whe[n] it is reasonably clear that there are realistic and attainable alternatives" to the practice under review.[238] If there are no less restrictive means to achieve the objective in question, then the pro-competitive and the anti-competitive effects of the practice will have to be balanced. The exercise is fact-sensitive, but it should be

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237. As Samsung has done by developing Galaxy Apps.

238. Commission Guidelines on the Application of Article 81(3) of the Treaty, 2004 O.J. (C 101) 97, 108 (formerly Article 81(3) of the Treaty Establishing the European Community, but now referred to as Article 101(3) of the Treaty on the Functioning of the European Union). This is the wording used by the Commission in dealing with the application of the third condition under which an agreement that restricts competition under Article 101(1) is nevertheless justified. Although the principle is set out in relation to Article 101, it clearly should be applied under Article 102 too. It is instructive to quote the entirety of paragraph 75: "The first test contained in the third condition of Article [101(3)] requires that the efficiencies be specific to the agreement in question in the sense that there are no other economically practicable and less restrictive means of achieving the efficiencies. In making this latter assessment the market conditions and business realities facing the parties to the agreement must be taken into account. Undertakings invoking the benefit of Article [101(3)] are not required to consider hypothetical or theoretical alternatives. The Commission will not second guess the business judgment of the parties. It will only intervene where it is reasonably clear that there are realistic and attainable alternatives. The parties must only explain and demonstrate why such seemingly realistic and significantly less restrictive alternatives to the agreement would be significantly less efficient."

guided by the fundamental principle that long-term social welfare is the ultimate goal of EU competition law. The demonstrable benefits that a standardised open source operating system has brought to the smart device sector are considerable. Against those benefits, it is not entirely obvious that the potential negative effects of preventing some differentiation of Android, which, as explained, remains possible anyway, should lead to the prohibition of what appears to be pro-competitive conduct.

VI. CONCLUSION

Tying has been a controversial abuse in EU law. The current *Android* investigation offers the Commission and, potentially, the EU Courts the opportunity further to clarify the test for anti-competitive tying, continuing the valuable, but somewhat unfinished refinement work achieved in *Microsoft I* and *Microsoft II*.

The EU case law on tying is still, formally, adhering to a pre-Chicago understanding of tying that requires, for tying to be an abuse, that the undertaking offering the bundle be dominant on the tying market, that the components of the bundle be separate products, that customers be coerced to obtain the tied product together with the tying product, and that tying has an anti-competitive effect, generally understood as the likely exclusion of competitors on the tying market. Finally, a dominant undertaking is permitted to put forward an objective justification by adducing sufficient evidence that the allegedly anti-competitive tying practice pursues a legitimate objective and is proportionate to the objective pursued. Yet, defences raised by dominant undertakings rarely, if ever, succeed. The weakness of this framework is that it lacks a robust assessment of the anti-competitive effects of tying and a realistic approach to the legitimate objectives that tying may pursue. However, this article demonstrates that the practice of the Commission has moved on from such an approach. In the EU tying cases, the Commission, in addition to the elements highlighted above, has also systematically taken into account the structural features of the tied market that make anti-competitive tying plausible. Furthermore, the Commission has also carried out a thorough analysis of the anti-competitive effects of tying, which is two-fold: (1) first, tying must be likely to exclude equally efficient competitors from the tied market and, (2) second, it must be likely to lead to the acquisition, maintenance, or strengthening of market power on an affected market (the tying market, the tied market, or a related market). This analysis is fully consistent with the post-

Chicago economic theories of tying and is also consistent with the case law of the EU Courts on tying and on exclusionary abuses more generally. Therefore, the article puts forward the following test for tying under EU law as sound in law and policy and supported, if not explicitly recognised, by the Commission and the EU Courts:

1. The undertaking offering the bundle is dominant on the tying market;
2. The tied market is characterised by strong demand-related efficiencies and barriers to entry that make tying a plausible anti-competitive strategy;
3. Components of the bundle are separate products;
4. Customers are coerced to obtain the tied product together with the tying product;
5. Tying is likely to exclude equally efficient competitors from the tied market;
6. Tying is likely to lead to the acquisition, maintenance, or strengthening of market power on an affected market (the tying market, the tied market, or a related market); and
7. Tying is not objectively justified. The objective justification defence requires that: (7.1) tying pursues a legitimate objective; (7.2) it is suitable to achieving the objective; (7.3) it is the least restrictive means of achieving the objective; and (7.4) the pro-competitive effects of tying outweigh its anti-competitive effects.

The current *Android* investigation brings some of the issues discussed above into sharp focus.

The existence of a dominant position on the tying market is a necessary element of the test. There can be no abusive tying without dominance. In both *Microsoft I* and *Microsoft II*, Microsoft had a very large and stable market share on the market for client PC operating systems. The market was characterised by strong barriers to entry and expansion, particularly in the form of network effects. In *Android*, conversely, it is unclear whether Google has a dominant position in respect of the tying product Play Store because the apparent lack of network effects and the open source nature of Android suggest that barriers to entry and expansion should not be high, even if there were a market for app stores for Android. The importance of a thorough assessment of dominance on the tying market cannot be overestimated: it is not only a legal requirement, but it guards against the risk of false convictions, which is particularly high when dealing with a ubiquitous and generally pro-competitive business practice, such as tying.

The structural features of the tied market are relevant to the analysis of tying quite simply because exclusion occurs on this market. For exclusion to be possible, the dominant undertaking must have a leading position on the tied market and the tied market must be characterised by economies of scale or direct or indirect network effects so that the dominant undertaking has the ability to marginalise competitors by depriving them of demand-related efficiencies. In both *Microsoft I* and *Microsoft II* there were strong network effects on the tied markets, namely the market for media players and internet browsers, respectively. In *Android*, the Commission would have to prove the presence of strong demand-related efficiencies on the (alleged) markets for general online search and licensable operating systems for smart devices. The structural analysis of the tied market should be carried out as a further screening test against the risk of false convictions.

The two-product test and the coercion test are necessary, but not sufficient elements for anti-competitive tying to occur. Furthermore, they are not reliable indications of anti-competitive effects. At most, they could be seen as safe harbours: if there is no independent demand for each product individually that could be satisfied equally efficiently by stand-alone competitors, or if customers are not coerced to obtain the two products together, there cannot be anti-competitive tying. But if the products are indeed separate and customers are coerced to obtain them together, this only means that anti-competitive tying is in theory possible, not that it is plausible or even likely. Furthermore, coercion is a matter of degree. The lower the degree of coercion, the more implausible the anti-competitive effects of tying are.

On the other hand, the likely foreclosure of as efficient competitors on the tied market is a necessary (but not sufficient) element of the test which goes to the root of the anti-competitive effects of tying. In *Android*, such as in *Microsoft I* and *Microsoft II*, the question is whether competitors can use distributional strategies that can offset the advantages that an allegedly dominant undertaking can achieve by tying. Whereas in *Microsoft I* and *Microsoft II* downloading was not considered an efficient distributional practice, the conclusion may well be different in relation to smart devices, where downloading apps is normal practice for consumers and the safety concerns or technical difficulties that consumers were believed to face in *Microsoft I* and *Microsoft II* are probably no longer relevant.

Proof of likely acquisition, maintenance, or strengthening of market power on an affected market is capable of playing a fundamental role in the assessment of tying: it identifies the

negative effects of tying beyond the effects on individual competitors, thus, also guarding against the risk of false convictions and over-deterrence. Both in *Microsoft I* and in *Microsoft II* the Commission satisfied this element of the test. In *Microsoft I*, Microsoft was acting to preserve its dominant position on the client PC operating system market and to gain significant advantage in neighbouring business areas, such as those for content encoding software, format licensing, wireless information device software, DRM solutions and online music delivery. In *Microsoft II*, the Commission preliminarily concluded that the tying of Microsoft's web browser Internet Explorer to Windows was a strategy to preserve Microsoft's dominant position on client PC operating systems. In *Android*, Google's incentive to foreclose the market for general online search services would arise from the increased profits to be made on the advertising side of the market. Its incentive to foreclose the licensable smart operating system market could arise from the preservation of market power on the market for general online search, by preventing the emergence of Android forms more likely to carry search apps competing with Google Search or web browser apps competing with Google Chrome. It could also arise from the preservation of market power on the market for general online search by acquiring or preserving market power on the market for app stores for Android, which could give Google the ability to continue to tie Play Store with Google Search or Google Chrome. However, unlike the market for client PC operating systems in the *Microsoft I* and in the *Microsoft II* cases, the market for app stores for Android and the market for general online search services appear to be characterised by much lower barriers to entry and no or low network effects, so that the plausibility of an anti-competitive tying strategy appears to rest on much thinner ground.

Finally, defences put forward by a dominant undertaking must be given serious consideration if they are substantiated by sufficient evidence. In tying, the realisation of economies of scale in production or distribution, the reduction of transaction costs, the preservation of interoperability, dynamic efficiency (innovation), and standardisation are all legitimate objectives that could be pursued by a tying strategy. To establish a defence, the dominant undertaking must adduce sufficient evidence to show that the tying under review is pursuing a legitimate objective, that the tying strategy is suitable to achieving such an objective, that there are no less restrictive means of doing so, and that the benefits of the practice outweigh its anti-competitive effects. It is then for the competition authority or claimant to prove that this defence put

forward by the dominant undertaking is not established on the facts, so that tying is, on balance, anti-competitive. In *Microsoft I*, a number of objective justification defences were rejected in law or on the evidence. However, the Commission and the EU Courts have, in principle, accepted that reduction in transaction costs, preservation of interoperability and goodwill, quality assurance, dynamic efficiency, and standardisation are legitimate objectives that can be pursued by tying. The *Android* case could clarify the availability of such defences in tying cases, particularly with respect to interoperability, quality assurance, and standardisation.