The unsung anti-trust economics of tying and bundling in Digital Markets

Revisiting Anti-trust priorities in light of emerging technologies[1]

Abstract

Recognizing consumer driven feedback loops, economies of scale and network effects as distinct and peculiar features of digital markets which quickly lead to them pivoting in favor of incumbent enterprise; jurisdictions across the world have today either enacted or are in the process of enacting special ex-ante frameworks to regulate anti-competitive conduct in such Schumpeterian multi-sided platform markets. These specialized legislations identify and prohibit certain pre-determined anti-competitive practices. The treatment of one of such practice namely Tying and Bundling forms the subject matter of inquiry for this paper. EU's DMA, which acts as a north star to other jurisdictions, treats tying and bundling as illegal per se. The author, however, mobilizes economics to present a contrarian viewpoint. In doing so the paper explores the following four questions - (a) To what extent can tying in digital markets be nuanced from an economic lens (b) While acknowledging the potential harms of tying and bundling, are there significant economic efficiencies that arise on account of tying in digital markets? (c) Whether the traditional theories of harm; leveraging theory and market foreclosure also hold true for digital markets? And lastly, (d) Whether EU's DMA is adequate to deal with the emerging technologies.

Keywords: Bundling, Tying, Technological integration, Digital Markets, Competition, Economics

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I. Introduction

Anti-trust regimes across the world today are undergoing a major overhaul. Traditionally competition jurisprudence has favored an ex-post approach where penalties would be attributed subsequent to the occurrence of harm. This was done due to two reasons; one that ex ante models risk false positives by over-regulation and two, that such over-regulations may lead to a chilling effect on innovation. However, the peculiarities of digital markets have forced countries to re-evaluate their competition frameworks and create specialized legislations premised on ex ante (predetermined) prohibitions which identify certain dominant players in digital markets and hold them to a higher scrutiny. The arguments for such 'special laws' have been two fold. The first set of arguments highlight the time extensive process of traditional competition laws that require long and complicated investigations and market studies *after* the harm has occurred – given the fast-paced 'winner take all' nature of market. The ex post approach thus would be inefficient in meaningfully curing the irredeemable hams in digital markets[2]. The second set of arguments focus more on the nature of digital markets itself arguing that the peculiar features of digital markets namely 'network effects' and 'economies of scale' sufficiently distinguish such markets from traditional markets - thus justifying special legislations. Jurisdictions such as EU, Germany, Japan etc. have already legislated such ex ante regulations however EU in particular stands out with its landmark Digital Markets Act ('**DMA**') introduced through the Digital Services Act Package in December 2020[3]. The DMA identifies 'Gatekeepers' providing 'core platform services' and casts both prohibitory and mandatory *ex ante* obligations on such Gatekeepers. Trailing not far behind, certain jurisdictions such as UK, USA, and my home country, India are in the process of enacting their own Digital Competition Acts. Thus, this paper comes at a very important time. What prompted my research in this space were the two recent reports released by the government of India namely the 53rd Report on 'Anti-Competitive Practices by Big Tech Companies[4]' (**1st Report**) by the Parliamentary Standing Committee on Finance released on December 2022[5] and the more recent - Report of the Committee on Digital Competition Law by the Ministry of Corporate Affairs, Government of India (**2nd Report**)[6]. Both these reports identify ten anti-competitive conducts such as search and ranking preferences, anti-steering, restricting third party applications and tying and bundling in line with the DMA. Having studied technology economics for quite some-time my attention was piqued by the provision relating to tying and bundling in the first report which viewed such practices as illegal per se with no exceptions. EU's DMA presented a similar view of tying and bundling.

To clarify in the interest of the readers unfamiliar with tying in Anti-trust economics, tying refers to combining or bundling core or essential services with complementary offerings, forcing users to by related services. However, what countries fail to realize in this regard are the peculiar, pro-competitive, consumer friendly and innovative effects of tying and bundling in digital markets – these economic efficiencies of

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[2] Dr. Tilottama Raychaudhari and Ramya Chandrashekhar, 'The Growing Necessity of Interim Measures to Preserve Competition in Rapidly Changing Digital Markets' (2021) Indian Journal of Law and Technology 17, p. 16-17

[3] Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act)

[4] Standing Committee Report (2022) <https://loksabhadocs.nic.in//Isscommittee/Finance/17_Finance_53.pdf> accessed on 30th July 2023

[5] 53d Finance Committee report on Anti-Competitive practices by Big Tech Companies (2022-2023) <https://loksabhadocs.nic.in/lsscommittee/Finance/17_Finance_53.pdf> accessed on 1st March 2024

[6] Report of the Committee on Digital Competition Law, Ministry of Corporate Affairs (2022) <https://www.mca.gov.in/bin/dms/getdocument?mds=gzGtvSkE3zIVhAuBe2pbow%253D%253D&type=open> accessed on 23rd March 2024

tying and bundling in light of emerging technologies have continually been ignored by policy makers while drafting anti-trust laws and that is the precise lacunae this paper aims to address. While the 2nd report (India) did indeed carve out an exception for tying and bundling in digital markets however the said exemption would only trigger if the tie was 'integral' to the provision of the Core Digital Service. This, although well intentioned was problematic due to the notion of 'technological integration' – the idea that a tie can produce a separate product altogether (I will argue this point in more detail later). Further, certain considerations such as degree of compatibility, consumer driven demand, multi-homing, reduction in search costs, double marginalization, quality improvements were absent from the legislative framework – left to the discretion of the Competition Commission of India - a body that lacks the technical knowhow to adjudicate issues such as 'technological integration'. This would ultimately lead to case specific decisions which would be vague, ambiguous, and often contradictory leading to direct fall in investor confidence in emerging technologies. As countries such USA, UK, Korea etc., like India, are in the process of drafting their own digital markets acts, it becomes critical that we highlight such unsung economic efficiencies of tying and bundling so as to ensure the new provisions in their respective digital competition acts are innovation friendly and holistic. Such is the goal of the paper. Further, the paper also questions example setting standard of the European DMA and highlights fallibilities of the DMA's provisions with respect to bundling and tying.

Pursuant to that objective, the paper in the Section I provides and introduction and sets the context, in Section II it highlights the ideologically history of bunding and tying and the jurisdictional inconsistencies engendering from the same, section III provides a nuanced analysis of the unsung economic efficiencies of bundling and tying in digital markets, Section IV provides alternative theories of viewing of budling and tying by rebutting traditional theories of harm, Section V highlights the inadequacy of the approach adopted by EU by taking the hypothetical example of Microsoft's Co-pilot, Section VI then finally concludes.

II. The humbug surrounding tying and bundling in digital markets

Tying arrangements, sometimes known as "ties" or "bundles" occur when a firm offers two different products together for one combined price, refusing to sell them individually, often colloquially defined as making the sale of one product conditional upon the purchase of another product[7]. Consumers are faced with tying on a daily basis, take for example cars sold with stereos or computers sold with certain hardware. It has now become a common business practice that has recognized efficiency benefits such as reducing cost and pricing inefficiencies through price discrimination, quality improvement, solving the problem of double marginalization and technological innovation through integration. At the same time, it may also result in anti-competitive harms such as market foreclosure, mitigating competition, obscure prices, limiting consumer choice etc. Different jurisdictions have historically had varying, often contradictory approaches to tying. Competition Law in both US and EU have not always appreciated that tying can have both harmful and positive effects. This controversy is exacerbated in digital markets where tying often leads to 'technological integration.' Some view them illegal and others not as much. This divergence of opinion showcased itself quiet poignantly in the Microsoft cases[8] where in the US, Microsoft was accused

[7] Winston, Michael D., 'Tying, foreclosure, and exclusion'., (1990) 80 The American Economic Review, 837, p. 837

[8] Case COMP/ C-3-37.792 Microsoft, [2005] 4 CMLR 965, Case T-201/04 Microsoft Corp v. Commission, Judgement of 17th September 2007; United States v. Microsoft Corp. (US Microsoft II), 147 F.3d 935 (D.C. Cir. 1998) and United States v. Microsoft Corp. (US Microsoft III), 253 F. 3d 34 (D.C. Cir. 2001)

of tying its internet browser, the Internet explorer with its operation system, Windows. Parallelly, in EU, Microsoft was accused of tying its windows software to its media player, WMP. Interestingly, however, both cases had drastically different outcomes. The US 9th circuit court of appeals remanded the cases to the lower court for a rule of reason analysis (this mimics the approach in Section 2 report from DOJ[9]), whereas in EU, the court of first instance (CFI) held Microsoft guilty of tying. As Hedvig Schmidt points out, this divergence of opinions further shows how the current approach to tying is ill-equipped to handle more advanced forms of tying, such as technological integration[10]. I take this point further, later in the paper, by introducing the case study of Microsoft integrating its products with Large Language Models to further problematize the current regulatory frameworks.

To understand the origins of this humbug, some anti-trust history may perhaps be an amicus curie. Hylton and Salinger divide economic theory relating to tying into three phases: Classical or Ordoliberal, Chicago and Post Chicago[11]. In the classical zeitgeist, court viewed tying from an illegal per se lens based on the 'leverage theory'. The leverage theory argued that tying was effectively an attempt to leverage market power in one market (tying product market) to foreclose competition in another market (tied product market)[12]. However, the Chicago school soon rebuked the arguments of the classicists. They argued that in terms of micro-economics, it is not possible for one firm to gain two monopoly profits[13]. Fast forward a few decades - the post Chicago school finally observed that there are both harms and efficiencies of the tying and hence it must be adjudged on a case-by-case basis. The US courts seem to be more influenced by the Chicago School than the post Chicago school[14]. EC courts, however, seem to be more influenced still by the Classicist School and so does their statutory requirements. This perhaps to a certain degree explains the divergence of judgements in the Microsoft rulings.

Categorizing tying

Nalebuff categorized tying in three main categories: Tying, metering and bundling. These were then further sub divided into subcategories such as pure bundling, mixed bundling, dynamic tying, and pure metering[15]. For the purposes of this paper, the author categorizes bundling into 4 main categories inclusive of 'technological integration'.

(a) Pure Bundling: Occurs when two or more products can only be purchased together and not individually.
(b) Tying: When two or more products can be purchased together and only one of the two products can be purchased individually.
(c) Mixed bundling: When two or more products can be purchased together (at a discount) or by themselves.

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[9] The US Department of Justice (DOJ) in June 2006 commenced hearings on the Sherman Act Section 2, which culminated in the publication of a report on the same matter in September 2008: 'Competition and Monopoly: Single-Firm Conduct Under Section 2 of the Sherman Act' (2008) Note: The report was controversially withdrawn by the DOJ in May 2009.

[10] Schmidt. Hedwig, 'Competition Law, Innovation and Antirust: An analysis of tying and technological integration' Edward Elgar Publishing Limited, 2009

[11] Hylton, K.N. and Salinger, N., 'Tying law and policy: a decision-theoretic approach' (2001) 69 (2) antitrust Law Journal 469, p. 469

[12] See also, International Salt Co. v. United States, 332 U.S. 392 (1947)

[13] Nalebuff, Barry, 'Bundling Tying, and Portfolio Effects, Part 1 – Conceptual Issues', DTI Economics Paper No. 1 (2003) p. 20.

[14] Hylton and Salinger, supra n. 10, p. 470

[15] Nalebuff, supra. n. 13, 13-17

(d) Technological integration: A unique kind of pure bundling were the two products are so integrated together technically that it becomes impossible for the user to sperate the two…may be due to the specific design choice that may result in innovation through the creation of a new functionality[16]. [Emphasis supplied]

The categorization of tying in such a manner becomes critical because certain kinds of tying will result in more harms in comparison with others, and therefore in a case-by-case analysis, it becomes important first to identify the type of tie. For instance, economists have already proved that mixed bundling causes less harm than tying from pure bundling[17]. Further, technological integration is also identified as a separate class of tie that marks a significant departure from traditional anti-trust thinking.

Interestingly however, the question of how one identifies when the two things are actually two different products has proven to be controversial – hence the exemption given to ties which are integral to the core platform service in the 2nd Report (India) is problematic. Today, with countries quickly enacting and adopting their own national 'digital markets acts' – with ex ante prohibitions to regulate dominant firms, there is a compulsive need to hold tying ex ante 'illegal per se' and give limited exemptions contingent on the identification of 'core platform service'. This, the authors argue is extremely problematic on four grounds: First, that such laws are made without fully undertaking a nuanced economic study of the markets with networking effects. Secondly, that such laws are drafted without a utilitarian understanding of the efficiencies of tying and bundling in digital markets. Thirdly, the law makers acutely fail to realize that all of the alleged harms that are used as a premise to base an illegal per se approach have an equal and opposite flipside and fourthly that such an approach is short-sighted and cannot deal with futuristic issues arising out of AI and Machine Learning integration. This makes identification of the core platform service deeply onerous if it results in technological integration. In these situations, issues more important than traditional ones (Consumer choice, leveraging theory etc.) become active. Namely, switching costs, search costs, multi-homing, technological integration and innovation, and algorithmic and/informational abuses.

53R Finance Committee Report on Anti-Competitive Practices by Big Tech (1st Report)

While the draft 53rd Finance Committee Report on Anti-Competitive Practices by Big Tech (1st Report) released in December 2022 correctly identifies futuristic issues however, its ex-ante approaches, partly inspired from EU's Digital Market's act may be problematic. In the said report, the Finance committee held that the harms of tying namely – leveraging theory, restriction of consumer choice and market foreclosure are sufficient for an illegal per se restriction, similar to EU's Digital Markets Act.

The recommendation of the 53rd Finance Committee on Anti-Competitive practices by big tech with regards to bundling is reproduced below:

> *The Committee, thus are, of the view that a SIDI should not force business users or end users to subscribe to, or register with, any further service as a condition for being able to use, access, sign up for registering with any of that platform's core platform service.*

[16] Kuhn, Kai-Uwe, Stillman, Robert and Caffa, Christina, 'Economic theories of bundling and their policy implication in abuse cases: an assessment in light of the Microsoft case (2005) 1 European Competition Journal 85, p. 88

[17] Charles River Associates, 'Innovation and Competition Policy, Part 1 – Conceptual issues', Economic Discussion Paper 3, March 2002, Report prepared for the Office of Fair Trading, 78

- *Replica of Section 5 (8) of Digital markets Act, EU*

The committee failed to pay heed to the fact that Europe has a specific ideological and economic history, one that relies on the 'classical' schools of thought and ordo-liberalism. It is that history which compels them to view tying as illegal per se. I, in a later section, shall prove how EU's approaches in DMA are ambiguous by taking an economic case study of Microsoft's Office tying itself with Chat GPT. America on the other hand has always been more influenced by the Chicago School and has a more lenient approach to tying as was observed in the Microsoft Cases. How a country deals with bundling and tying in digital markets is directly linked to innovation and consumer welfare and hence is of critical importance.

Report of the Committee on Digital Competition Law, Ministry of Corporate Affairs, Government of India (2nd Report)

The subsequent report released on 27th February 2024, while echoing all the findings of the 1st report, noted however that there may be some exemption that is necessitated while adjudicating cases of bundling and tying. The said report recommended an exemption of ties that are 'integral' to the provisioning of the core platform service however left the adjudication of such ties to the discretion of the Indian Competition Authority. Section 15 of the Draft Digital Competition Act on page 163 of the said report proposed in the said report is reproduced below:

> *15. Tying and Bundling:*
> *A SIDI shall not require or incentivize business users or end users of the identified Core Digital Service to use on or more of the Systemically Significant Digital Enterprise's other products or services, or those of:*
> *(a) Related parties; or*
> *(b) Third parties with whom the Systemically Significant Digital Enterprise has arrangements for the manufacture and sale of provision of services*
> *Alongside the use of the identified Core Digital Service, unless the use of such products of services is integral to the provision of the Core Digital Service.*
>
> *Explanation: For the purpose of this section, the Commission may specify, by regulations, the nature of products or services that may be considered 'integral' to the provision of a Core Digital Service.*

While the 2nd report does indeed carve out an exception for ties, it is limited in its scope to only those ties essential for the provisioning of the Core Digital Service. This approach would be rendered facetious as the in the case of Technological Integration, the tie itself produces a different service/product altogether – in such an event, going back to the provisioning of the Core Digital Service would be futile. Further the exemptions leave no room for economic justification such as when the tie is demand driven, reduced consumer search costs, reduces prices by countering double marginalization and produces 'superior technological efficiencies'. These efficiencies and their economic rationale are argued for in the next section. What I highlight through this paper, using the very recent Indian developments is that such that it is jurisprudential and economic burden of each developing country while enacting their digital anti-trust legislations to understand the nuances of the debates surrounding any of the ex-ante sections in their new anti-trust provisions for digital markets and set their priorities straight – whether they favor competition, consumer welfare, or innovation. This trifecta of priorities often occurs to the detriment of each other and therefore, establishing a clear hierarchy among these three is key to making a uniform digital markets act. The post Chicago school, through its rule of reason and case by case analysis, does exactly that.

However, to undertake any such hierarchical exercise, one would be forced to confront the debates within competition law. The assertions which refute leveraging theory, which argue against consumer choice, and which propose novel ideas such as technological integration, all ought to be laid bare before the policy makers to sort out from.

For this hierarchical sorting, a country must first decide, in general terms, for what purpose its competition law operates. Public choice scholars for instance would claim that competition law operates for the benefit of small businesses, whereas some other faction would claim it is the consumers who are the real beneficiary[18]. Chicago school theorists, such as Robert Broke would here interject and argue that competition law ought to serve the sole purpose of economic efficiency[19] but would be immediately rebuked by others who claim it is in fact, the avoidance of 'wealth transfers' from consumers to producers that lay at the heart of it all[20]. They would see competition law as a function of a normative morality. Once a country decides it priorities on a more general economic level, it can then apply the policy to more specific areas and anti-competitive harms such as bundling and tying. The generality must inform the specifics, so the law remains consistent.

In the long term however, given the rapid pace of technological development, even a nuanced rule of reason approach to tying in digital markets might be inadequate. The issues of the future are far too complex and are often 'black boxes' to fit perfectly in an economic model. Technologies move in multiple stages of complexity – from traditional computation (like a calculator) to machine learning, to deep learning and finally to neural networks[21]. As they become more complex, it becomes harder for humans to infer causality[22] – see for example tacit algorithmic collusion that continues to remain unregulated[23]. The author suggests that in the long-term newer methods such as computational anti-trust that empower computational agencies with advanced technologies, such as machine learning prediction and analytical models must be used to automate anti-trust enforcement. However, as has been argued previously, new schools of anti-trust can only be founded upon policies built on rule of reason that allows for flexibility. Such policies recognize the 'grey'. To effectively take out the black and white from the grey, newer computational tools can be employed to better assist computational authorities. However, an illegal per se approach precludes any such application by declaring the practice as a whole as 'illegal per se' with no exceptions or nuance.

III. Recognizing the unsung efficiencies

Today, most economists agree that competitive benefits and efficiencies by tying should be balanced alongside its harms to adjudicate whether a certain practice should be barred as 'anti-competitive' instead

[18] See Reiter v. Sonotone Corp., 442 U.S. 330, 343 (1979) See also, Phillip Lowe, Director General, European Commission Directorate General for Competition, Consumer Welfare and Efficiency – *New Guidelines and Principles of Competition Policy* (Mar. 27, 2007)

[19] Bork, Robert H. 1978. The Anti-trust Paradox: A policy at war with itself. New York: Basic Books

[20] Lande, Robert H. 1982. Wealth Transfers as the Original and Primary Concern for Anti-trust: The Efficiency Interpretation challenged. Hastings Law Journal 34:65

[21] Jain, Aditya. 2023. An Interdisciplinary approach to automation bias in Finance: What law, history and data science ca teach us. ICTACT Journals on soft computing, Vol 14, Issue 1, Pages 3159-3164 10.21917/ijsc.2023.0439

[22] Charlotte A. Tschider, "Beyond the Black Box", *Denver Law Review*, Vol. 98, No. 3, pp. 1-14, 2021. See also,

[23] OECD (2017), Algorithms and Collusion: Competition Policy in the Digital Age http://www.oecd.org/competition/algorithms-collusion-competition-policy-in-the-digital-age.htm

of following blindly an 'illegal per se' policy. In this section we make an effort to extend this argument to digital markets as opposed to only being applicable to traditional markets. On a utilitarian axis, I assert that the efficiencies gained by such tying might outweigh the competitive harm and hence ought to be permitted. This section shall highlight such efficiencies and offer new models to look at tying especially in technologically advanced markets. The purpose of the author in highlighting these unsung efficiencies is to further bolster the fundamental argument made in the paper - that the economic rationale for illegal per se approaches to tying in digital markets is shaky and lacks nuance.

1. **Cost reduction:**

A manufacturer benefits from selling their products in a bundle. It reduces their production costs, distribution costs, licensing costs and marketing. More so, If the tie is resulting from consumer demand, it benefits both the manufacturer in time saving and the consumer in transaction costs. This is often the case in technologically complex markets. As Salinger explains, it is more profitable for a consumer and the manufacturer to purchase these products in a bundle since its lowers the costs especially when the demand is positively correlated, and the costs of individual components are high[24]. A succinct example is the computer which now comes with graphic cards in built. Kuhn et al., however, rebukes this claim and asserts this is a 'joint production fallacy'[25]. He argues that solely on account of the manufacturer 'manufacturing' the goods together, it does not require him to 'sell' them together. While Kuhn et al., are correct in their initial assumption, they fail to take into account the diseconomies of scale that might occur as a result of being forced to sell the two products together. O' Donoghue and Padilla further hint at this rebuttal in their paper[26]. Another traditional rebuttal to cost reduction is that it reduces consumer choices. The 53rd Finance Committee further posits such an assertion. While this argument indeed holds water for traditional markets, for digital markets however, two things must be kept in mind; One, that producers may often not be able to offer certain kinds of products individually at profitable prices to customers that they are willing to pay[27] and two, that restrictions on consumer choices may be outweighed by reduction in transaction costs, especially in technological markets with advanced products. If technologically complimentary products and services are sold in a bundle, the consumer is saved of the need to go and look for the best possible combination which requires a certain technological know-how. In the early years of the computer, all products had to be sold individually which caused grave and onerous search costs to the consumer. Today to get the computer in a bundle significantly reduces the search costs and thus we get the bundle in a 'just works, right of the box form'. This argument can also be applied to apps and was also raised by Google in the 1st Report but was not paid any serious heed. The question therefore remains - if the bundle is on account of consumer demand, what is prohibition of tying achieving? Perhaps the preclusions of big tech firms to use their dominance to foreclose other markets is one reason, nevertheless, even if such is the case, it has to be balanced against consumer welfare.

2. **Quality Improvement:**

When technological services are tied together and sold, it may result in quality improvement in functionalities of the product. Photocopiers and cartridges are a succinct example. If a manufacturer requires his own cartridges to be sold with the photocopier, it may increase the quality of the product. If

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[24] Salinger, Micheal A., 'Graphical analysis of bundling' (1995) 68 The Journal of Business 85, p. 98

[25] Kuhn, Stillman and Carfara*, supra* n. 17, 107

[26] O' Donoghue, Robert and Padilla, A. Jorge, The law and economics of Article 82 E (Hart Publishing, Oxford and Portland, Oregon 2006), Ch. 9

[27] Charles River Report, supra n. 18, p. 320

something goes wrong with the photocopier on account of using an external cartridge, the producer will be blamed which will lead to loss of his trademark reputation. 'Compatibility' thus becomes an issue of central importance. Naturally, as products become more technologically advanced, the issues of compatibility will apply to a greater extent[28]. In technological markets more so, a bundle of products can be more valuable than the sum of individual products especially if the combination leads to creation of new functionalities on account of significantly higher compatibility. In US Microsoft II, Microsoft argued a similar point and highlighted how the integration of Windows OS and Internet Explorer made it faster but was yet again not paid any heed to. It becomes important here to note that, the 'improvement' must also be of such a superior degree so as to offset any anti-competitive harm on account of innovation. This test of 'superior improvement' was also posited in EC Microsoft cases. A mere reduction of speed does not amount to serious improvement.

3. Reduction in search costs:

As Evans and Padilla point out, the widespread use of bundled products is not simply on account of cost reduction but also a function of better technology[29], innovation and consumer demand. As products become more advanced, the consumer loses the knowhow to assemble the best combination. The more technologically advanced the product is, the more beneficial it would be for the consumer to purchase them in one bundle in addition to them, getting a lower price due to reduction in costs of production. Further, the market also expands by making the products more user friendly. The benefits of product integration increase with technological sophistication.

4. Pricing Efficiencies due to price discrimination:

As Stigler, a Chicago School Theorist explains, price discrimination allows firms to profit out of differences that different customers place on the value of the different goods[30]. Bakos further elaborates that in cases where the customer base is heterogenous and there are minimal marginal costs, price discrimination increases demand without increasing costs[31]. Charles river report notes that in order for tying to have positive effects due to price discrimination, the firms require market power in the tied product market. More importantly, it further notes that when tying is applied in conjunction with price discrimination in markets with network effects or economies of scale, it may have positive effects on welfare overall. This kind of practice is prevalent in mobile phones and network operators. Software products have low marginal costs and high fixed costs and are hence economies of scale. On the contrary, hardware has a much higher marginal cost. Hence, by cross subsidizing marginal costs from software to hardware, firms can make their tied products cheaper and entice more consumers that were previously unwilling to buy. This practice is prevalent in the gaming market comprising of manufactures such as Sony and Nintendo. Thus, some Chicago Scholars argue that price discrimination is mostly efficiency and welfare enhancing[32] and is essentially the approach adopted in US. Contrastingly, influenced by Classicists, Price Discrimination continues to remain an illegal per se practice in EU. Hence, a country must again make a call as to how they are going to adjudicate price discrimination. In the interests of uniformity and

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[28] Ahlborn, Evans and Padilla (2004) supra n. 7
[29] Ibid
[30] Evans and Salinger, supra n. 27, p. 49
[31] Bakos, Y and Brynjolfsson, E, 'Bundling information goods: pricing, profits and efficiency' (1995) 45 Management Science 1613, p. 1617
[32] Ahlborn, Evans and Padilla (2004) supra n. 7

predictability of business risks, such a position has to be statutorily stipulated and not left to courts to decide.

5. A counter to the double marginalization problem:

Digital markets comprise of oligopolies and monopolies in an imperfect competition. Based on general economic theory, monopiles tend to be price setters. Their demand curve slopes downward however unlike economies in perfect competition the demand curve does not equal the marginal revenue curve. The more a monopoly wishes to sell, the more it must lower his price. A rational monopolist, like any profit maximizing firm will only produce and sell the quantity at which Marginal Costs equal Marginal Revenue. However, in a monopoly since the Marginal Revenue is less than the price in a monopoly, the monopolist produces where MC=MR<C. In summary, a monopolist makes profit by setting a price above its marginal cost, taking advantage of its market power. This allows the monopolist to extract more value from consumers and generate economic profit, which may not be possible in a perfectly competitive market where prices are driven down to the level of marginal cost. In the event that a monopolist sells his produce to a distributer, who in also happens to be a monopoly, he will in turn also set his prices in the same manner. The inadvertent result is that the consumer has to bear two monopoly profits when he decides to purchase the product. This is known as double marginalization. As Nalebuff writes, there is something even more pernicious than monopiles – a chain of monopiles[33]. A simple solution to the problem of double marginalization is the vertical integration of the two monopolists via tying. This effect is even greater when the products are complimentary due to the Cournot effect[34]. Two monopolists would ordinarily sell their complimentary products at individual prices. However, if they are to integrate and sell the products in a bundle, the could sell the bundle at a lower price taking advantage of the additional demand for one of the products as reduction in price of the other.

Unfortunately, we see western authorities continually display ignorance of the harms of the double marginalization on the consumer. In the US Microsoft case for instance, the commission proposed a breaking up of the company in two which was accepted by the district court but later vacated by the court of appeals on grounds of it being without sufficient reason. In the event that the two companies had indeed broken up, they would retain their monopoly statuses in their respective markets and thus the end consumer would have to suffer extra monopoly costs on account of double marginalization.

6. Technological Integration and an incentive for Innovation

Technological integration occurs when two products are so technologically tied together that they produce a new functionality all together. Economists seem to be in tandem with the idea that technological or product integration is a natural progression stage in high technology markets especially the software industry. It acts as an incentive to innovate and further benefits customers. Winston in his model interestingly showcased a contrarian observation. He showcased how a monopolist operating in a market with network effects could leverage his dominance to affect other competitors' ability to also benefit from technological integration because the risk of entering the other market for the competitor, either the tied product market or the tying product could be too high[35]. However he assumed that such technological

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[33] Nalebuff, supra. n. 13, 18-23

[34] Cournot, Augustin, Research into the Mathematical Principles of the Theory of Wealth (Ed. N. Bacon Macmillan, New York, 1897)

[35] Whinston, Micheal D., 'Tying, foreclosure, and exclusion', (1990) 80 The American economic review, 837, p. 837

integration was 'incompatible' with the competitors product in the tied product market[36]. If the technological integration is indeed found to be compatible with the competitors product, and consumers are free to use the competitor's bundle, the question then remains whether the benefits to costumers on account of the competitors, outweighs the marginal costs of the bundled products[37]. These principles therefore ought to be a north star in court's assessment of the economic rationale when they adjudicate whether a certain tie when technologically integrated, is justified by economic efficiency. Schmidt however, questions whether the judge or the competition authorities have the technical know-how to assess the technical nature of the product. It is at this junction that 'computational anti-trust' can play a part. Ahlborn et al introduce an easier method and categories tying in two categories, one of contractual tying and the other of technological integration. They further argue for a moderate per se legal approach to technical integration. I however suggest that such a test could be too lenient especially due to the worries raised by Winston. Hence a test for 'superior technological integration' could be adopted as was adopted by the European courts. It asserts that not only must the 'tier' show that there is an improvement in the product on account of tying, but that such improvement is substantial to such a degree that it creates a new functionality all together. This is in tandem with the CFI's 'superior technological product performance' test. This superior technological efficiency would thus outweigh any anti-competitive effects the technological integration may generate[38].

7. Tying as an incentive to innovate

Tying can also be a direct incentive for firms to innovate. Choi, in his three stage models applies game theory to prove how tying can result in a higher investment in R&D[39]. In the initial stage of Choi's model, Company 1 makes the decision on whether to engage in bundling. Subsequently, in the second stage, both companies undertake R&D activities aimed at reducing costs. Finally, the third stage involves a pricing competition, incorporating the cost structure derived from the R&D outcomes. Choi's findings suggest that opting for tying can serve as a signal of commitment to more assertive R&D investments. Hence, game theorists are almost in unanimity that tying must not be adjudged as illegal per se in technological markets but rather a case-by-case approach has to be applied taking into account the market power of the tied product[40]. The question again remains one of priorities. It is a matter of policy, whether a significant level of innovation can offset any potential anti-competitive harm. And if yes, to what degree. An ex ante illegal per se approach cannot accommodate such a utilitarian analysis.

IV. Rebutting Theories of Harm: Leveraging theory and Market Foreclosure

One of the primary reasons for competition authorities to view tying for an anti-competitive lens, propagated by classicists is the leveraging theory i.e. the ability of the dominant firm to expand its market power in the secondary market by taking advantage of its power in the primary market. Thus, it may foreclose competition. Hence, in spite of its multifarious efficiencies, authorities have been rigid and strict when it comes to tying. Scholars in favor of the leveraging theory argue that by driving the competitions

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[36] Schmidt, Hedvig. Supra n. 10, p. 38

[37] Ibid.

[38] Compare with Brief of Prof. Lawrence Lessig as Amicus Curiae, in United States v. Microsoft Corp., D.C. of Columbia, Civil Action No. 98-1233 (TPJ), 1 February 2000, pp. 11-13

[39] Choi, Jay Pil, 'Tying and Innovation: A dynamic analysis of tying arrangements', Revised May 2002

[40] Heinemann, Andres, 'Facts over Theory: The contribution of Behavioral economics to Competition Law', January 2019, pg. 5

of the tied product market, the dominant firm can effectively gain two monopoly profits[41]. On the other hand, Chicago Theory scholars provide an interesting rebuttal to this claim. They assert that the idea that a monopoly can make two profits via tying is a 'fallacy of double counting'[42]. Their argument is now more formally known as the 'single monopoly profit theorem': when two products and/or services are combined together and applied as one, there is in the end only one product. And therefore, only one monopoly profit can be exploited[43]. In the words of Richard Posner himself,

> *A fatal weakness of the leverage theory is its inability to explain why the firm with a monopoly of one product would want to monopolize complimentary products as well. It may seem obvious that two monopiles are better than one, but since the products are by hypothesis used in conjunction with one another…, it is not obvious at all. If the price of the tied product is higher than the purchaser would have had to pay in the open market, the difference will represent an increase in the price of the final product or service to him, and he will demand less of it, and will therefore buy less of the tying product*[44].

Having discounted the leveraging theory, the Chicago School theorists finally arrived at the conclusion that tying in a net positive and results in consumer welfare and therefore should be treated legal per se. However, that is only one side of the coin. The actual harms are very real especially in markets with network effects and winner take all product races. In high technology industries for instance, risks for a new entrant are enormous due to large sunk costs and fixed costs. Tying can in these markets acts as a trigger for the winner take all outcomes. Kuhn et al., for instance use the EC Microsoft case to make their case against the Chicago Theorists and showcase how tying can quickly result in foreclosure due to a 'snowballing effect' via a trigger of the networking effects and further cause market foreclosure. However, what such an argument fails to take into account is that networking effects can be counterweighed by markets with high multi-homing and minimal switching costs. In the presence of high multi homing, the competition authorities must fight the temptation to protect competitors but rather limit Competition Law for the protection of 'competition'.

Notwithstanding the leveraging theory, two other aversions have been cast upon the practice tying. One, that is results in restricting consumer choice (also one of the premises for the illegal per se approach in the 1st Report), and second that it results in price obfuscation. With regards to the former, it also already been proved how in technologically advanced markets, restriction on buyers choices can be a net good since it effectively reduces transaction costs. Hence, in technological complex markets, where search costs are high, that consideration must be effectively weighed against the restriction on buyers choices. Price obfuscation is further also not so much so to restrict competition but rather as an impediment to consumer choice. While price obfuscation could be an efficient strategy of entering the market, there however remains the risk that it can mislead consumers. Hence, the competition authorities will also have to factor in the same.

As the above discussion suggests, the debate around tying and bundling in light of both its efficiencies' and potential harms and market foreclosure continues to be unsettled. The Indian Digital Competition

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[41] Jacobs, Micheal, 'Third line forcing and tying arrangements – some comments on the United States position', article published on the Blake Dawson Waldron web site: Competition and Consumer Protection (6 January 2004)
[42] Posner, Richard A., Antitrust Law: An Economic perspective (University of Chicago Press, III., 1976)
[43] Bowman, Ward S., 'Tying arrangements and the leverage problem' (1975) 67 The Yale Law Journal 19.
[44] Posner, Richard A., supra n. 35

Act provided in the 2nd Report while affording ex ante measures of prohibiting certain anti-competitive practices must also recognize this nuance and open the stage for a more in-depth discussion. The 53rd Finance Committee report on anti-competitive practices by big tech (1st Report) notes certain harms of tying with respect to tying such as (a) creating asymmetry in pricing, (b) removing competition (c) Harming innovation (d) and enabling leading players to leverage their market power onto the secondary, market they remain oblivious that each of those assertion have a flipside which can result in consumer welfare, increase innovation and further be pro-competitive. The continued use of leveraging theory as a basis for the illegal per se approach is incorrect. Google's defense of pre-installing certain apps so that the phone works right out of the box may not be incentivized by an anti-competitive intention but rather from consumer demand since installing every app result in significant transaction costs. To make a normative judgement over the most efficient app results in enormous search costs for the consumer demanding technical know-how and knowledge of 'compatibility'. Further the proposition by the finance committee that such tying leads to 'higher prices ultimately' is also without nuance since it fails to consider that specific application developers also have a quasi-monopoly in certain areas. This would cause the problem of double marginalization for the consumer, which can only be solved by vertical integration by tying i.e. by tying the MobileOS with pre-installed apps. Interestingly, on Page 15 of the report the Chairperson himself notes the following:

> *"In some cases, bundling is efficiency enhancing. In some cases, it is against competition. So, we are taking a very nuanced view"*

However, it seems that the chairpersons view did not make it to the final proposal by the committee. It proposed to import the section on prohibiting bundling and tying from the EU's Digital Markets Act section 5(8). EU jurisprudence, as argued previously, continues to be heavily influenced by the classical school of thought whereas the markets of tomorrow require a more nuanced post-Chicago ideological basis.

The foundation of ex ante measure in digital markets is the tendency of 'networking effects'. However, in offsetting the networking efforts, multi-homing and platform switching by users is more than prevalent today. Pina Ackman, in her piercing paper suggests that nearly 40 percent of the users have switched platforms and for those who have not switched, the reason is for the most part, their satisfaction for the product[45]. Think in terms of platform switching by a user from android to iPhone. Such multi homing and platform switching act as a countervailing measure to the so-called network effects that form the premise of the European DMA and the Indian Draft Digital Competition Act. In such cases, tying even in cases of digital markets with network effects becomes benign in terms of competition authorities. The competition authorities must realize, the purpose of competition law ought to be the protection of competition and not of competitors. In presence of high multi-homing, by imputing ex ante restrictions on innovation onto SIDI's is the competition law really seeking to protection competition? Especially if the tying leads to technological integration.

The key here is to find out whether the 'technological integration' or tying is also compatible with the competitor. Anti-trust law in these cases must not be an impediment to innovation. As Qian and Niels

[45] Pina Akman, A Web of Paradoxes: Empirical Evidence on Online Platform Users and Implications for Competition and Regulation in Digital Markets,16 Virginia Law and Business Review 217 (2022).

point out, in digital markets general concerns about tying in traditional markets should be abandoned and a new comparative approach must be adopted. Possibility of multi-homing must force competition to tether their digital competition law to only protect 'competition' and not 'competitors'. The presumption that limiting consumer choice must necessarily lead to consumer harm must be abandoned given the highly technical nature of digital markets.

V. Inadequacy of EU's DMA: Chat GPT and Microsoft's co-pilot

EU's DMA approach to tying has proven inadequacies and must not become a copy paste model for emerging economics. A case study in this regard could be the novel integration of ChatGPT and Microsoft into one bundled product called copilot. ChatGPT uses a generative pre trained transformer, and a large language model to process language and give accurate outcomes bases on assessing the content in its substance and context to give accurate results. It is given an undisclosed large data set from the internet to iteratively learn to produce accurate results for the user. Throughout the year 2022 and 2023, Microsoft has invested more than 10 billion into OpenAI, the company that created Chat GPT. Microsoft now intends to integrate ChatGPT into their flagship product Microsoft 365 that provides for greater efficiencies to the consumer in terms of iteratively drafting mails using AI or creating PowerPoints just by some commands.

At the outset, it becomes necessary for the DMA or Competition law Authorities to note the superior efficiencies that may arise due to such technological integration and direct pro-competitive effects such innovation, reduction is search costs and creation of new functionalities due to technological integration. The next test for the competition authorities would be regarding 'switching costs'. Since Machine Learning inherently uses an iterative process to self-learn using the continual use of its services by the user, there would be high switching costs unless if the user is permitted to import all of its learning data into another AI content generation tool. The technical feasibility of such an instance currently seems implausible but it should make for a factor in the determination of anti-trust violations. Microsoft has already notified its gatekeeper status under Article 3 (3) of the DMA to the European Commission. However, DMA only attracts its provisions to the 'core platform services' of the gatekeeper, hence there arises yet another moot question as to whether the integrated tool shall constitute a core platform service.

To reiterate, there arise two principal problems when one applies the tying provisions of DMA to Microsoft's copilot. Firstly, Section 5 (8) of the DMA prohibits the tying of 'core platform' service only with another 'core platform service' and not with other non-core platform services. If AI content generation is not a core service, the adjudication of tying would again fall within the traditional competition law which, as highlighted above, already has proven normative inconsistencies and short sighted-ness.

Secondly, as Peter points out, it continues to be unclear whether Section 5(8) of the DMA covers technological integration.[46] In the event that the competition law authorities hold AI content generation to be a non-core platform services the tying will have to pass through the traditional Article 102 (2) (d) of the European competition law. The four-factor test established in Microsoft cases will be applied. (i) The tied product and primary product are two separate products (ii) the undertaking concerned is dominant in

[46] Peter George Picht, 'ChatGPT, Microsoft, and Competition Law – Nemesis or Fresh Chance for Digital Market Enforcement', University of Zurich

the market for the tying product; (iii) the undertaking concerned does not give customers a choice to obtain the tying product without the tied product; and (iv) the practice in question forecloses competition. Right at the outset the separate product test looms large. It is unclear whether the self-learning capabilities of such a product makes it a separate standalone product or not.

Thirdly, one can make the case that the integration of ChatGPT and Microsoft Office would be covered well within the purview of 'superior technological efficiency' generated via integration which results in substantial performance improvement and consumer welfare. Hence both the traditional competition law, and the DMA are ill-equipped and un-nuanced to be a comprehensive statue to deal with technologies of the future, especially in cases of bundling and tying. India is therefore better informed to not import the EU DMA and its subsequent provisions relating to tying and bundling. Different jurisdiction and schools of thought have varying approaches to competition law and varying priorities as to whether to favour consumer interest, innovation, market foreclosure or prohibition of wealth transfers. Needless to say, an illegal per se approach to digital markets in the context of tying is not a favourable approach given the unsettled economic debates within the subject. The commission along with the finance committee must think deeply on each of debates and table out its priorities clearly and succinctly to have a competition law of tomorrow catered to digital markets.

VI. Future of Competition Enforcement: Computational Antitrust

As highlighted through the above case study, illegal ex ante approaches towards regulating competition concerns in digital markets is not the best approach – especially in cases involving bundling and tying. While the opposite - 'rule of reason analysis' approach located within the economics of tying is arguable better than the 'illegal per se approach', it is also not completely future proof. Given the rapid pace of technological development, the concerns of the future are far too complex to be able to sufficiently be dealt with by pure economic human logic. In the future therefore, traditional economic schools must make space for more novel approaches to anti-trust. An example is the novel school of 'computational anti-trust' developed by the Stanford University Codex Centre at Stanford Law School[47]. Computational Antitrust explores how legal informatics could foster the automation of antitrust procedures and the improvement of antitrust analysis. Some examples are - detecting communication between firms using machine learning by P. Brown et al[48], using Regtech by developing an Antirust API that automates anti-trust compliances for firms using decision based logic trees by Schrepel[49], using merger simulations to predict economic harms in a simulated market environment by Budzinski and Noskova [50], and using ML algorithms in financial markets to determine anti-trust abuse markets by Coglianese & Lai[51]. While these technologies make for a whole another paper, needless to say, these approaches to anti-trust are the future. I exalt the readers to make a conscious effort to read through the authors talked about above. A digital

[47] The school of Computational Antirust was developed by the Stanford Codex Centre Computational Antitrust Project in January 2021. There website can be accessed at https://law.stanford.edu/codex-the-stanford-center-for-legal-informatics/computational-antitrust-project/

[48] Brown, Cajero. et al, 'Information and Transparency: Using Machine Learning to detect Communication between Firms', Stanford Computational Antirust, Vol. 3, 2023

[49] Schrepel, Thibault, The Making of An Antitrust API: Proof of Concept (October 12, 2022). Stanford University CodeX Research Paper Series 2022 3 Stan. Computational Antitrust 22 (2023), Available at SSRN: https://ssrn.com/abstract=4241927

[50] Budzinski, Noskova. 'Prospects and Limits of Merger Simulations as a Computational Anti-trust tool', Stanford Computational Anti-trust, Vol. 2, 2022

[51] Coglianese & Lai, 'Anti-trust by Algorithm', Stanford Computational Anti-trust', Vol 1. Issue 1, 2021

markets act aiming to regulate the 'future' must make space for futuristic innovations for enforcement. Having stated that. the challenges for such an approach are immense; building organizational capacity, avoiding legal pitfalls, and establishing public trust and therefore these technologies would take a decade or so be implemented. Whether a UK type sandbox is required for the implementation of such technologies or rather controlled and supervised rolling out is the prerogative of the government – but that is a question left for the next decade. What is clear however is that, for 'futuristic schools' to result in policy innovations in lieu of emerging technologies, an illegal per se approach to bundling and tying must be abolished since it pixelates the economic nuances underlying the foundational assumptions of harm. For the short term however, a rule of reason approach to bundling and tying may, perhaps, better serve innovation, consumer welfare and free markets. The alternative theories, or rebuttals highlighted through this paper must nuance anti-trust policy discourses, which an 'illegal per se approach precludes. It has been observed that tying and bundling have various efficiencies as well as pro-competitive and welfare enhancing effects that need to be taken into account before any illegal per se approach is adopted especially in digital markets. Distinct ideologies such as ordo liberalism, classical school, Chicago school, post Chicago school drive the competition policy of a country and anti-trust policies must not comprise on such debates and economic nuances via an 'illegal per se approach'.

VI. Conclusion

The analysis presented in this paper propounds one fundamental assertion - that an illegal per se approach to tying in bundling in digital markets lacks sufficient economic nuance. To further this assertion – I utilise a threefold analysis. Firstly, I suggest that due to the novel technologies used in digital markets and further the broader 'technical nature' of digital markets, tying and bundling produces novel economic efficiencies such as (a) a demand driven cost reduction of the tied product, (b) Quality improvements due to 'compatibility', (c) a reduction in search costs for the consumer, the benefits of which gets compounded due to the technical & compatibility sensitive nature of digital products (d) pricing efficiencies due to price discrimination (e) creation of new functionalities due to 'Technological integration' (f) Incentives to innovate due to gamification. All these novel economic efficiencies need to be countenanced with the alleged harms of tying such as market foreclosure due to networking effects. The second leg of the analysis rebuts the traditional theories of harm against tying and bundling to further nuance the subject matter. Multi-homing in digital markets acts as a counter to the networking effects. Further, tying often solves the problem of double marginalisation in oligopolistic markets which can interestingly benefit consumers. The third leg of the analysis challenges the European Digital Markets (which India considers as model law) by applying it to a hypothetical case of Microsoft tying Large Language Model's to its traditional products such as MS Word. The author argues that the framework under the European DMA would fail to holistically address this issue. Hence, the threefold analysis of the paper aims to nuance the economic understanding of digital markets for both the Commission and the Policy Makers. In the last section, I briefly showcase the promising future of 'computational anti-trust', the development of which, is contingent on two things: One, a shift away from an illegal per se approach and two, development of a nuanced understanding of digital markets.