
NETWORK EFFECTS AND TIPPING: WHEN SHOULD THE LAW INTERVENE?

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ABSTRACT

The digitalisation of markets has prompted competition law to reckon with a phenomenon that traditional antitrust frameworks were not equipped to address, that is, network effects and the tipping of platform markets. This paper undertakes a preliminary analysis of network effects, drawing on available theories, literature, and case studies, to formulate a coherent understanding of their endogenous nature, which facilitates market concentration and the structural entrenchment of dominant platforms. Examining how same-side and cross-side effects give rise to self-reinforcing flywheels wherein big gets bigger, the paper identifies market tipping, that is, the moment a product reaches critical mass and its dominance becomes self-sustaining, as a central concern for competition authorities globally, particularly as platforms transition from market participants to gatekeepers. The paper critically evaluates the tension between ex post and ex ante enforcement mechanisms, assessing landmark cases such as *United States v. Microsoft Corp.*, *Eastman Kodak*, and *CCI v. Google LLC*, alongside the European Union's Digital Markets Act. Against this comparative backdrop, it locates India's regulatory approach within its emerging market transformation, highlighting the absence of adequate consideration for network effects in cases such as the WhatsApp privacy policy matter and the Fast Track Call Cabs judgment, and examines the Digital Competition Bill of 2024 and the proposed SSDE framework. The paper ultimately advocates for a calibrated, context-sensitive, and proactive legal response, one that intervenes at the stage of path formation rather than after lock-in, and that imposes structural, portability-oriented obligations rather than relying solely on conduct-based prohibition.

Keywords: Network effects, market tipping, competition law, digital platforms, ex ante regulation, Digital Markets Act, Digital Competition Bill, platform gatekeepers, switching costs, dominance, Indian competition law.

1. Introduction

Competition policies, as embodied in antitrust laws, have a significant effect on economies and the way companies conduct themselves. It is rare for a week to pass without an article in the press on some facet or potential violation of competition policy. Whether companies have colluded in price fixing? Has a company leveraged its power in another sector? For all their seeming precision, whether the Sherman Act or the Competition Act in India, these policies and laws can be quite imprecise to navigate in contemporary markets. A natural starting point for the study of this dilemma is to understand what gives enterprises a competitive advantage in this platform mediated market.

What illuminates this discussion is an appraisal of the lived reality of companies like Uber, Airbnb, Ola, and Amazon, which use digital technology to connect multi-sided networks of individual users. The inquiry now departs from the traditional industry regulations, as seen in the quintessential modelling examples of a cement industry in an oligopolistic sector, to a broader market position retained through network effects by large players to bolster their dominance. Reid Hoffman advanced the view that these effects “generate a positive feedback loop that result in super linear growth and value creation.”¹ This is indicative of a self-reinforcing dynamic which we shall consider later in the paper.

The paper seeks to use a preliminary analysis of network effects, along with available theories, literature, and case studies, as the basis for summarising an analytical framework necessary to formulate a coherent understanding of their endogenous nature, which facilitates market tipping and concentration. By synthesising these insights, the paper aims to establish a structured framework for legal intervention in networked markets, balancing ex post and ex ante enforcement concerns.

2. Network Effects, Tipping, and the Endogeneity of Market Boundaries

a. Understanding Network Effects: Concept and Dynamics

The inventor of Ethernet, Bob Metcalfe, had proposed that the value of a communication network is the square of the number of people on that network. The underlying idea behind

¹ Reid Hoffman and Chris Yeh, *Blitzscaling: The Lightning-Fast Path to Building Massively Valuable Companies* (1st edn, Currency 2018).

Metcalfé's Law is right in terms of the classical definition of network effects, i.e., if a product or service has more users, it becomes more valuable to existing users. Every extra node that is added on the network increases the number of connection. Facebook is often cited as a textbook example of Metcalfé's Law in practice.

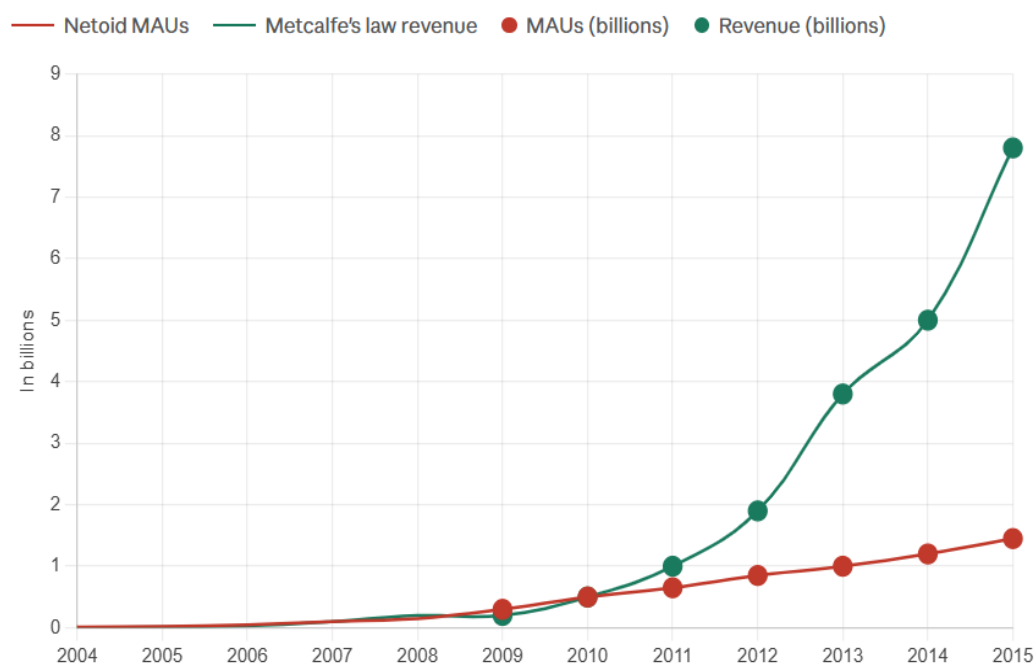


Figure 1. Network Growth and Revenue Scaling in Facebook: An Empirical Validation of Metcalfé's Law (2004–2015)²

Facebook grew at an impressive rate. As monthly active users (MAUs) grew from negligible levels to billions, the platform's revenue did not just scale linearly but expanded exponentially. This cumulative growth dynamic between user base and monetisation capacity is a serious concern for competition law, as also recognised by various courts and regulators (EU, UK CMA, US FTC). If users alone start defining the structural capacity of these platforms, especially in digital markets, it may lead to tipping in the market, which would not be merely because of the superior quality of the product. Network effects also become misleading when regulators apply user count metrics, because traditionally, under Article 102 of TFEU³ or even Section 2 of Sherman Act,⁴ one needs to measure power and not size to establish dominance.

² XZ Zhang, JJ Liu and ZW Xu, 'Tencent and Facebook Data Validate Metcalfé's Law' (2015) 30 *Journal of Computer Science and Technology* 246 <https://doi.org/10.1007/s11390-015-1518-1> accessed 13 April 2026.

³ Governs abusive conduct by dominant undertakings.

⁴ Under Section 2 of the Sherman Act, it is illegal to monopolize or attempt to monopolize the market.

Shapiro and Varian in *Information Rules* produce a more authentic perspective which can be helpful to understand network effects' impact on competition law. In this information economy, network externality has become a major feature. This feature is largely understood in terms of collective switching cost and positive feedback. Collective switching cost would mean that if one wants to leave Facebook and switch to a rival platform, they would have to convince others too to switch. The cost of leaving is then multiplied across all users, making it hard to abandon the dominant product. Positive feedback, on the other hand, is a facet of this effect wherein growth feeds itself, i.e., more users → more valuable network → attracts even more users → repeat. This leads to early scale lock-ins before other rivals can accumulate their own network.

Network effects stand on the structure of same-side effects and cross-side effects. A same-side or one-sided market is one where there is a preference regarding the number of other users on one's own side, whereas a two-sided market involves effects in each direction, i.e., preferences regarding the number of users on the other side. Each effect can be positive or negative.

However, there are many other subtleties and dynamics which go beyond the number of users. The central idea can get lost in metaphor if we do not take into account canonical examples like data

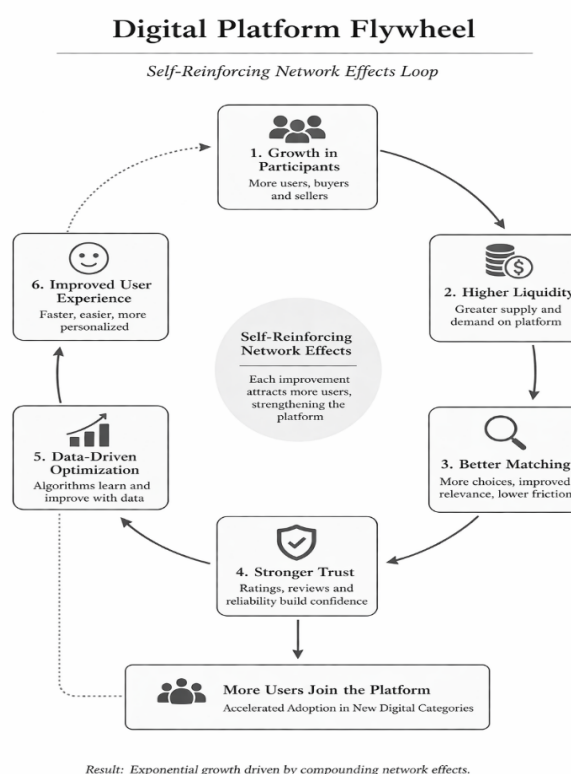


Figure 2. A compact flywheel linking participant growth to liquidity, matching, trust, and data-driven optimization—creating self-reinforcing network effects that accelerate adoption in new digital categories.

network effects, where the value of data accrues to a particular company, making the company more valuable. Nonetheless, it is definitely true that network effects are powerful and important because there is that core flywheel that big get bigger.

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b. Market Tipping: From Critical Mass to Dominance—The Need for Intervention

The discussions above answer why some products suddenly become indispensable to everyone. This moment of widespread adoption is what we call the tipping point for network effects. It is this specific stage where a product or service reaches critical mass users; then the product's value drives its own accelerated adoption and growth.

The European Commission's big idea for the digital economy is to regulate tipping markets. There is tipping when a product wins a market. To put it graphically: it is when a product becomes a verb— "I google," "we WhatsApp." But why is tipping a problem? Some say tipping leads to long-lasting monopoly problems. For instance, Apple Inc., thirteen years after the launch of the iPhone, continues to collect a thirty percent commission fee for the distribution of games like Fortnite from Epic Games or music apps like Spotify.

Katz and Shapiro's study exhibit an interesting perspective as to whether and why such network markets are prone to tipping. They treat tipping as a process wherein "one system pulls away from its rivals in popularity once it gains an initial edge, so that market may shift towards a de facto industry standard."⁵ Other assumptions that underlie to explain when markets are tippy

⁵ Louis Kaplow and Carl Shapiro, *Antitrust* (NBER Working Paper No 12867, National Bureau of Economic Research 2007) <http://www.nber.org/papers/w12867> accessed 12 April 2026.

or not is through “indirect effects that give rise to consumption externalities.” Thus, literature of such nature largely refers to emergence of a dominant firm vis a vis positive feedback or multiple equilibria (more than one firm could become dominant, depending on early user adoption) as tipping. *United States v Microsoft Corp*⁶ is a canonical tipping model for the reason of dominance of the same nature of Windows, due to developers writing apps for Windows → more users → more developers’ structure.

Thus, network effects, even when they sound conducive to incentivizing customers, become problematic in the realm of competition law, especially when innovators can no longer ensure that products offer standalone value even with few users. A seamless and engaging user experience should encourage retention and organic network expansion. Reaching the tipping point creates a powerful, often insurmountable, competitive moat for businesses. Understanding this threshold is essential for achieving sustainable growth and market dominance.

The question of why the law must step in does not solely lie in the elimination of competition through the dominant intermediary, but also in regulating the locus through which competition occurs. Herein we have a normative competition shift from platform rivalry to within-platform competition, i.e., among sellers and complements. This offers the benefit that more users might lead to more liquidity and duplication, but the platform can also become a gatekeeper in such cases. It gets the power to decide rankings, visibility, and influence who succeeds.

Even when tipping occurs after crossing this threshold, the dominance does not have to be permanent. Portability of platform-driven identities can be flattened, and multi-platform equilibrium can be achieved via better laws and regulation, especially when the market does not correct itself.

The structural concentration due to winner-takes-all, built-in entry barriers of high switching costs and non-portable reputation, gatekeeping without abuse, and the persistent trade-off problems create an endogenous limit to achieving healthy competition in network markets in economies of large scale. Here arises the need for well-equipped frameworks to address this issue.

⁶ *United States v Microsoft Corp* [2018] 584 US

3. Intervention or Restraint? Calibrating the Legal Response

Going through the second part of the paper that deals with the legal response to network markets, we realise that in a digitalised economy there are practices that may have a pro-competitive and efficient impact, and there are cases in which they may be harmful. Amidst this complex and dynamic environment, competition authorities have been presented with challenging questions concerning the proper role for the application of competition law. Big tech companies in digital markets have been the target of several famous antitrust decisions for abuse of dominance. The digital economy has led to the emergence of novel practices like network effects that may not necessarily fall within traditional pre-existing types of abuse, triggering a heated debate about the appropriate legal treatment.

a. Ex Post or Ex Ante Enforcement in Tipped Markets

The American case of *Eastman Kodak Co. v. Image Technical Services, Inc.*⁷ established how, in a platform-driven market, lock-in and switching costs alone can enable exploitation. It shows that ex post regulation can address lock-in, but only retrospectively. Gaps in competition law therefore motivate ex ante discussions. *CCI v. Google LLC*⁸ exhibits the same logic. Even the most aggressive digital remedies dictating Google to allow third-party billing and side-loading can prove to be insufficient, mapping onto the same tension, as mandatory sideloading, which should have been an ex-ante obligation, was imposed belatedly at an ex-post stage.

Thus, modern contemporary law navigates amidst these blurred market boundaries and evolving economic rationales. Countries globally are attempting to replicate the Digital Markets Act, which has shaped EU competition policy by virtue of more effective ex ante regulation. For 15 years, the law relied on ex post tools to curb large American enterprises, which are now classified as gatekeepers under the DMA. Based on the antitrust methodology of fairness, Recital 3 of the regulatory instrument aims to prevent imbalances between business users and gatekeepers, and Recital 32 elucidates the concept of contestability, which seeks to decrease entry barriers, as well as direct and indirect network effects and economies of scale and scope.

Although DMA has inspired proposals for ex ante regulations in countries around the world,

⁷ *Eastman Kodak Co v Image Technical Services Inc* [1992] 504 US 451 (1992).

⁸ *Google Inc & Ors v Competition Commission of India & Anr*, [2015] Writ Petition (Civil) No 7084 of 2014

including India, the question of when the law should intervene remains rather ambiguous to date. It is rather difficult, as Peter Swire also argues, to decide when natural monopoly justifications apply to digital platform markets, which are now characterized by network effects, high market share, and consumer dependability.⁹

b. Locating India's Regulatory Approach within Emerging Market Transformations

We shall, in this context, analyse whether legal categories in India have evolved enough to embed ideal theories of competition in platform markets driven by non-physical entry barriers like network effects.

India remains a developing nation where many enterprises are at a nascent stage of development. Therefore, for India, there remains a persistent issue of whether to intervene or not to intervene so as to not stifle innovation. But pitfalls of non-intervention come at the cost of a Type II error based on a false null hypothesis, and the harm is missed.

What is notable in many cases is absence of consideration for analysis of network effects and their impacts. In the saga of the WhatsApp privacy policy case of Vinod Kumar,¹⁰ abuse of dominance was intriguingly rejected as it was argued that consumer choice and consent go hand in hand as also envisioned by Section 11¹¹ of our Personal Data Protection Bill, but in here it was neglected how WhatsApp soft nudges its consumers to a lock-in because of constraints created by network effects.

In 2017, in the Fast Track Call Cabs¹² case, did the authorities properly acknowledge the network-based aggregator models adopted by taxi services such as Meru, Fast Track, and Easy Cab? The judgment notes the role of network effects in generating sufficient positive externalities for the riders and drivers who are part of the two-sided marketplace. Other than this concern, there is an overarching notion to balance general welfare against respect for the rights of individuals, and the balancing of effectiveness against legitimacy.

For law to inculcate a conducive regulatory intervention in this era of virtual hegemony, it is

⁹ Peter Swire, 'The Portability and Other Required Transfers Impact Assessment (PORT-IA): Assessing Competition, Privacy, Cybersecurity, and Other Considerations' (2022) 6 *Georgetown Law Technology Review*.

¹⁰ *Shri Vinod Kumar Gupta, Chartered Accountant v. WhatsApp Inc.* Case No. 99/2016 [2017] CCI

¹¹ Grants individuals (Data Principals) the right to access information from Data Fiduciaries.

¹² *Fast Track Call Cab Pvt. Ltd. v ANI Technologies Pvt Ltd.* Case No 74 of 2015 [2017] CCI.

important to have a proactive approach, knowing when and where to intervene.

c. Error Costs and Timing: Rethinking the Intervention Threshold

Pinpointing why and when markets are most likely to tip can be challenging. Therefore, in competition law, timing of intervention by regulatory authorities is crucial to assess the conduct of players and tipping of market. A seemingly simple market phenomenon can often be traced back to human psychology, where tipping occurs through cascading, domino-like effects. Even small perturbations can trigger significant changes across the entire system.

It is not to say that present laws and policies are completely devoid of effective *ex ante* oversight. The Digital Competition Bill of 2024 envisages a category of Systemically Significant Digital Enterprises ('SSDE'). To identify dominant enterprises in platform markets, Section 3 of the Bill adopts something similar to the DMA. If a certain enterprise meets specific user-based criteria or certain financial thresholds, it would be classified as an SSDE, taking into account qualitative factors such as network effects and other data-driven advantages persisting in new markets.

Although this acknowledges that tipping happens subtly. Yet by the time regulators notice dominance, it has already been structured by invisible forces. No amount of penalty can actually undo market power or interoperability mandates that are imposed after these network-driven ecosystems have already become deeply entrenched.

An effects-based approach should be called for assessing and identifying various types of anti-competitive harm, each interpreted *ex ante* as a consistent story grounded in sound economic theory of network markets. The possible efficiency gains by a dominant firm should be checked, along with whether they are actually passed on to consumers, grounded in the idea of an independent market and not one where consumers are mere puppets of enterprises. I might be concurring with the Chicago School to some extent because of the consumer emphasis, but in such markets the as-efficient competitor test can be said to generate many false negatives.

Recognising that network effects, tipping, and data-driven markets can become entrenched before they appear in competitive market assessments, there has to be an earlier and context-sensitive intervention which is more proactive. Tests like the AEC and even the AECC may fail because they do not account for the structural advantages created in these markets.

Given the serious flaws in current trends in competition law, at the stage India is in its economic growth, a level playing field should be allowed, but does it come at the cost of removing precautionary ex ante regulations? The reality, however, is that it is not a level playing field; most sectors, especially digital ones, have clear market leaders. It takes a lot to get user attention to shift the needle.

Competition law, even if it intervenes early, should not be paradoxical in the sense that it acts without sufficient market analysis. SSDE designations lack a formal threshold, which can drive away foreign investment and impose onerous compliance costs on new start-ups, thereby harming India's emerging innovative ecosystem.

Thus, it is to be noted that tipping happens because of firms of paramount significance, as also stated in Section 19a¹³ of Germany's competition act. This displays a very nuanced position that does not argue on the merits of ex post or ex ante approaches, but rather advocates a calibrated response to market structures through better targeting of firms that lead to tipping.

Competition law needs to shift its approach from prescribing broad categories of anticompetitive exercise of market power. Instead of focusing on the reactive aspect (prohibition of certain conduct), obligations under the law should be positive or proactive, wherein the economic actor is required to perform certain functions.

Baumol's theory is praised for recognizing the contestability aspect, which explains how monopolies may behave in a competitive manner when entry barriers are frictionless.¹⁴ However, in networked markets, contestability is often destroyed, implying that law should intervene not only when abuse is proven, but when such entry barriers become endogenous.

Borrowing from Arthur and David's notion of path dependence,¹⁵ policies should be framed in a manner that also intervenes at the stage of path formation of these enterprises, which is pre-tipping, not after lock-in occurs and the enterprise establishes itself. Other than the timing, like mentioned earlier, proactive duties such as portability and fair choice architecture should be

¹³ Authorities can now intervene at an earlier stage and preventively prohibit certain types of behaviour of certain companies that are of "of paramount significance for competition across markets"

¹⁴ William J Baumol, John C Panzar and Robert D Willig, 'Contestable Markets: An Uprising in the Theory of Industry Structure: Reply' (1983) 73(3) *The American Economic Review* 49
<http://www.jstor.org/stable/1808145> accessed 14 April 2026.

¹⁵ W J Baumol, J C Panzar and R D Willig, 'Contestable Markets: An Uprising in the Theory of Industry Structure: Reply' (1983) 73(3) *The American Economic Review* 491.

aligned with the potential innovation powers of various firms, not restricting the market analysis to one specific niche.

Unlike the UK, India has a consistent competition law policy, but instead of imposing scrutiny through conduct-based intervention, structure-preserving regulation that does not solely rely on information-light policies,¹⁶ as also stressed by Tirole, should be preferred. In network markets, data is disaggregated, and it is through structural analysis of what is hidden that the antitrust regime can correct a lopsided market.

4. Conclusion

The asymmetric case of network markets, as discussed in the paper, leads to one indisputable conclusion: to understand such markets is to pick a needle from a haystack. One good obiter in a platform-driven market can serve as a factual basis to recognize when markets tip, but this has not been achieved yet. It would make no sense to argue that a law like digital competition law is not needed; what needs to be answered is who will it cover? Will it make the networked digital world a fairer place? But again, the question with any sort of regulation is whether it is an enabler or something that is reigning some parties in, in hopes that others will grow. Deliberating on a law in this sphere, the CCI has to understand it, as suggested earlier, through case-by-case analysis instead of cherry-picking from European laws. Thus, I contest that, to be context-specific, an SSDE whose core digital service is minimal should not really be regulated for that specific service.

In a tech-driven economy, platforms have played the role of both referee and player. China is one such country which, through its revision of anti-unfair competition law, acknowledged the need to impose real responsibilities on platforms, wherein platforms are now deemed to be managers of their own ecosystems, having a proactive duty to review their own conduct and that of their merchants. There exists a note of caution here as well as to over-excessive supervision, but the nation does well in extending competition regulation beyond legal authorities to a culture of compliance.¹⁷

¹⁶ Jean Tirole, *Market Failures and Public Policy* (Prize Lecture, 8 December 2014)

¹⁷ Slaughter and May, 'China Strengthens Digital Market Regulation with Revised Anti-Unfair Competition Law' (4 November 2025) <https://www.slaughterandmay.com/insights/new-insights/china-strengthens-digital-market-regulation-with-revised-anti-unfair-competition-law/> accessed 15 April 2026.

Thus, for the law to move through the ambiguities of network markets, it has to ensure that it assesses the environment carefully where the risk of rupturing tipping markets exists, and not only tipped markets. Refinement of ex ante enforcement tools can lead to a better tailored regime which, while avoiding heavy-handed remedies, seeks more of a hybrid of both ex-post and ex-ante to challenge the dynamic competition and rapid technological changes.