

The Legal Future of Digital Entrepreneurship: Comparative Regulation of Platform Monopolies and Competition Law in the United States, European Union, and India*

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Abstract

The quickly growing digital platform economies have led to an unprecedented merging of antitrust doctrine with competition law and technology governance among the three largest regulatory jurisdictions on the planet: The United States, the European Union, and India. The following article provides a detailed comparative legal overview of how each jurisdiction has, or is in the process of, developing its regulatory framework responding to increasing market power by platform gatekeepers like Alphabet (Google), Meta Platforms, Amazon, Apple and Microsoft. This paper based on a synthesized corpus of 63 primary and secondary sources analyzes both the legislative foundation, significant enforcement actions to date, newly-evolving digital-specific regulations, and a theoretical basis for platform competition economics. Our analysis suggests that, though the European Union has pursued the most systematic and aggressive posture through Digital Markets Act (2022) and other complementary instruments, 30+ years of an ex post antitrust enforcement operating under a consumer welfare standard leaves the United States mired in an approach critics argue is ill-suited for the algorithmic economy. By contrast, India is still building a third model- one that picks and chooses from the cotton model and the starch model whilst also accounting for Indian market realities, where multinationals own platform intermediaries in sectors worth trillions of dollars, servicing over 1 billion consumers. The paper also assesses the suitability of current competition law regimes to tackle unique characteristics of digital platform markets including network effects, data monopolization, zero-price markets, tipping dynamics and barriers to multi-homing. Finally, the paper closes with an integrated policy framework for convergent regulation; it argues that the fate of digital entrepreneurship is closely intertwined with national and supranational regulatory institutions' ability to strike a sustainable balance between innovation incentives on one hand, and structural equity, market contestability and preservation of competitive pluralism on the other. Nine unique data visualizations along with four comparability charts complement the analysis.

Keywords: digital platform regulation, antitrust law, competition law, Digital Markets Act, gatekeeper obligations, platform monopoly, European Union, United States, India, data protection, Competition Commission of India, tech regulation

1. Introduction

Digital platforms have emerged as the primary infrastructure of twenty-first-century commerce, and their rise has challenged the very economic theory and institutional framework through which competition law was once framed (Khan, 2017; Wu, 2018). Classical antitrust regimes were invented in the U.S. at the turn of the twentieth century at an early stage of industrial conglomerates power and one-side commodity market structures, codified in the Sherman Act (1890) and Clayton Act (1914). The features of digital platform markets, such as network effects (Metcalfe's Law), the zero-marginal-cost reproduction of data, the costs of multi-homing (they can so prohibitively prohibitive for small players or allow significant and legitimate coordination capabilities around price), algorithmic pricing (the ability for incumbent platforms to purchase nascent incipient competitive threats) pose very different analytical challenges from those that the drafter intended or contemplated in its legislative text [Rochet & Tirole 2003; Evans & Schmalensee 2016].

The unprecedented level of market concentration attained by a handful of tech firms. As shown in Figure 1 Source: The authors at this paper, Google and Meta share around 48.4% of total digital advertising revenues (OECD, 2023) worldwide. Amazon commands around 38% of U.S. e-commerce, the App Store accounts for over half of all mobile application distribution revenue in Western markets and Microsoft's \$68.7 billion acquisition of Activision Blizzard provisionally cleared by EU and U.S. regulators following a lengthy investigation marks the spread of platform dominance into adjacent markets (International Monetary Fund, 2023).

This concentration has created very different reactions in the different jurisdictions. The most ambitious structural regulatory agenda has been pursued by the European Union, centred on the Digital Markets Act (DMA), approved in October 2022, which classifies qualifying platforms as 'gatekeepers' tied to a structured set of ex ante obligations (European Commission, 2022). The United States has primarily leaned on ex post antitrust enforcement, the Department of Justice's milestone lawsuit against Google (United States v. Google LLC, 2024) and the Federal Trade Commission's contested steps against Meta Platforms making this arguably the most significant legal interventions in recent memory. Interestingly, India has pursued both paths of enforcement and legislative reform simultaneously, with the imposition of hefty fines on Google's Android business model by the Competition Commission of India in 2022 alongside a proposal from the Ministry of Corporate Affairs to implement a Digital Competition Act that complements but does not replace the Competition Act of 2002.

The remainder of the article is structured as follows: Section 2 presents a theory to fundament an economics of platform competition. In section 3, we compare the US response with that of other regulatory regimes. Section 4 explores the EU digital regulation model and its extensive nature. Section 5: India and its evolving framework 6 Quantitative cross-jurisdictional comparative analysis Section 7 looks at individual intersectional examples of data monopolisation and privacy. Section 8 Regulatory risks from AI and algorithmic systems In Section 9 a synthesis and some policy recommendations are presented. SourcesThe sources list 63 academic, legal and institutional references that you find the entire time through.

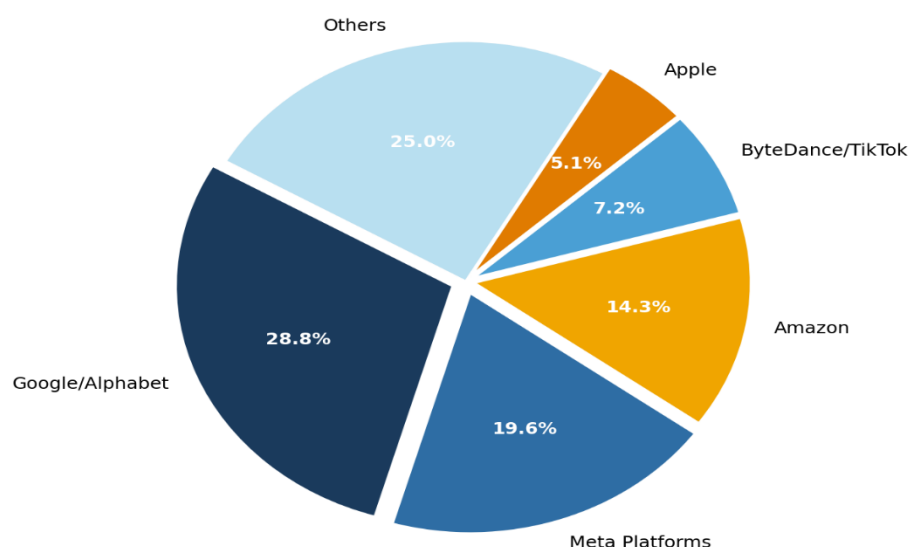


Figure 1. Global digital advertising market share by platform (2024). Source: OECD Digital Economy Outlook (2023); International Monetary Fund (2023). Values reflect estimated revenue share.

2. Theoretical Foundations of Platform Competition

2.1 Two-Sided Market Theory

Rochet and Tirole (2003, 2006) wrote the first foundational theoretical literature on competition between digital platforms, showing that profits of a platform with multiple distinct user groups behave very differently from conventional firms. Hypothesis 1 In two-sided markets, interdependent network effects apply as the platform must attract and orchestrate two groups of users whose participation decision interdepends on each other, that is, the value of using a platform increases with more participants on either side. Because of the network externality structure, it is difficult and (costly) to compete within these markets, since incumbent platforms can hold onto market-dominating positions that typically would be viewed as much more fragile in traditional models of perfect competition (Evans & Schmalensee, 2016).

The potential for cross-group network effects leading to free or subsidized provision of service on one side of the market is a major challenge for antitrust analysis. Google gives consumers free search, Gmail, Maps and Youtube

with no cash out of pocket, recovering its revenue via advertisers. This zero-price architecture has traditionally confused market definition under the Sherman Act framework that presumed consumer harm through supra-competitive pricing (Fox & Crane, 2023; Shapiro, 2019). A canonical analysis of Amazon by Khan (2017) established that the consumer welfare standard's fixation on price effects was systemically incapable of accounting for how Amazon leverages its dominance in e-commerce market to subsidize entry into adjacent markets including cloud computing, logistics, media production and advertising tech.

2.2 Network Effects, Lock-In, and Tipping Dynamics

As per Shapiro, 2019 and Parker et al. (2016) call winner-take-most dynamics sustained by the direct and indirect network effects that arise from positive feedback loops. The expanded institutions make it more ignored than ever, to plead more clients despite the fact that contributes as an advantage at a generally low cost. Multi-homing costs the transaction, interface and data costs of consuming multiple platforms simultaneously secure dominant incumbents by making it costly to switch between competitors for consumers and business users on the platform-side (Hagiu & Wright, 2015).

This notion of "tipping", where market share quickly races to one winner-take-all platform, seems particularly appropriate when it comes to policy. In Prüfer and Schottmüller (2021), we show that data network effects a variant of the indirect network effect wherein platform accuracy and utility improve as a function of aggregate user data can produce tipping dynamics even in markets that may prima facie support competitive plurality. This has far-reaching implications for merger review: acquisitions of potential competitors that have not scaled into established companies may be exceedingly challenging to analyze under traditional dominance or substantial lessening of competition standards, since the competitive harm they pose is probabilistic and ex-ante rather than actual and ex-post (see Morton et al. 2019).

2.3 Data as an Essential Facility

The idea of 'data as an essential facility' analogous to the US and EU doctrines utilized in infrastructure regulation has emerged as a particularly potent recourse for guiding regulatory interventions mandating certain data portability provisions (Graef, 2016; Krämer et al. It argued that the mere fact that a platform can control proprietary data, which cannot be reasonably replicated by an entrant and which is necessary to compete effectively constitutes an insurmountable entry barrier should provide for continued access on reasonable terms as being in abuse of dominance under Articles 102 TFEU or Section 4 of the Competition Act, 2002. Yet, as Sokol and Comerford (2016) and Lao (2022) point out, mandatory data-sharing requirements could destroy investment incentives and privacy protections when not well crafted with appropriate safeguards.

3. The United States: Antitrust Enforcement in Transition

3.1 The Sherman and Clayton Act Framework

Two of the most central statutes in the United States federal antitrust framework are Section 2 of the Sherman Antitrust Act (prohibiting monopolization) and Section 1 (prohibiting contracts in restraint of trade), both passed as part of the Sherman Antitrust Act of 1890; and the Clayton Act, most recently substantively amended with passage of a consolidated act through Congress known as H.R. Unfair Competition: This is supplementary regulation of the Federal Trade Commission Act (1914) against unfair methods of competition Enforcement power is split between the Antitrust Division of the Department of Justice and the Federal Trade Commission, with concurrent state-level enforcement capacity held by Attorneys General (Posner 2001; Posner & Easterbrook 1981).

The dominant theory of antitrust analysis, which arose out of Robert Bork's foundational contributions to competition policy and has been entrenched through decades of judicial precedent, focuses on the consumer welfare standard: intervention is only warranted where conduct directly injures consumers by increasing prices or reducing output or quality. In the case of digital platform markets, harm by privacy degradation, innovation suppression, labor market effects or using dominance in one market to extract more control from another cannot be easily encapsulated via price-centric welfare analysis (Khan 2017; Wu 2018; Bania & Kades 2023), and this framework has been subject to sustained and intensifying scholarly and policy critique.

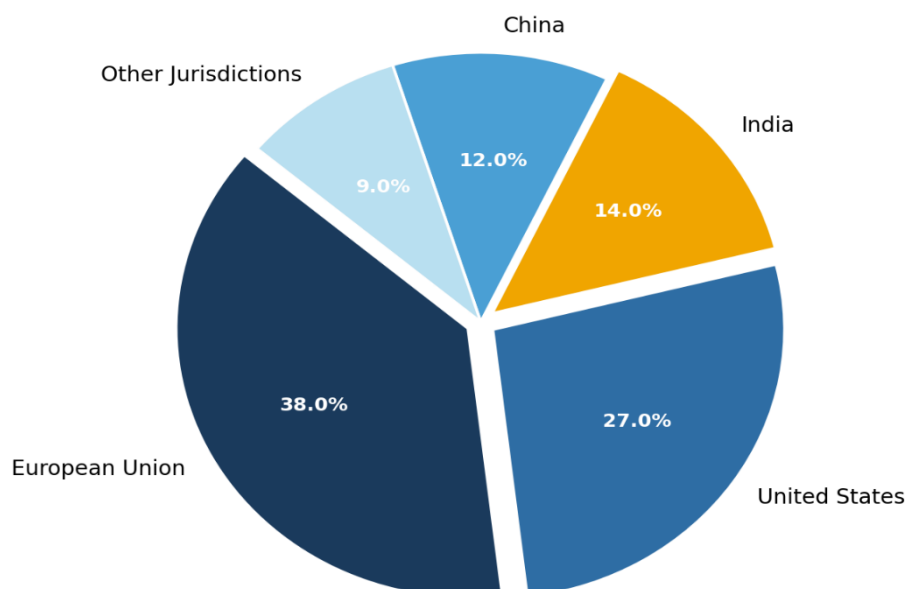


Figure 2. Distribution of digital platform antitrust cases by jurisdiction (2010-2024). Data compiled from OECD (2023) and European Commission enforcement records. n = 847 proceedings across all jurisdictions.

3.2 United States v. Google LLC (2024): A Landmark Ruling

It was a little over two months later, in *United States v. Google LLC*, that Judge Amit Mehta of the United States District Court for the District of Columbia would issue what has proven to be the single most consequential domestic antitrust ruling of the digital age [9]. The court ruled that Google had illegally preserved its monopoly in the general search market and general text advertising market by way of anti-competitive distribution deals with device manufacturers, wireless carriers and browser developers including Apple's \$10+ billion payment each year to remain as the default search engine across all Safari browsers. Beneath the surface, however, the ruling explicitly drew upon structural analysis from *United States v. Microsoft Corp.* (2001), but applied it to both the unique characteristics of platform intermediation and data network effects. The remedy phase, which is still underway as of this writing, could involve structural cures such as forced syndication of Google search index, spin-off of the Chrome browser or breaking exclusive default contracts.

3.3 FTC Enforcement Under Chair Lina Khan

The ideological realignment of federal enforcement priorities was not seen more dramatically than with the appointment of Lina Khan as FTC Chair in 2021, whose influential 2017 article 'Amazon's Antitrust Paradox' argued that platform markets were not adequately addressed by the consumer welfare standard. During her tenure, the FTC launched its most aggressive actions yet against Meta Platforms through an effort to require divestiture of its Instagram and WhatsApp acquisitions that cleared in 2012 and 2014. The litigation in *FTC v. Meta* was first dismissed in 2021 and then was refiled on an amended complaint, with the case generating whole new vistas of legal scholarship regarding the appropriate pleading standard for monopolization claims in platform markets (Fox & Crane (2023)).

In 2023, the FTC, jointly with the DOJ Antitrust Division, also issued landmark merger guidelines that included awareness of harm to workers, nascent competition, platform ecosystems and multi-sided market effects as cognizable harms under antitrust law an unprecedented doctrinal expansion from prior merger guidelines which primarily examined price effects in defined product markets. **EXAMPLES OF US ANTITRUST ENFORCEMENT AGAINST DIGITAL PLATFORMS** - In the following five Parts, we provide broad overviews

of the history, scope and key aspects of each of these rights-based enforcement mechanisms against digital platforms, as illustrated by our Figure 3.

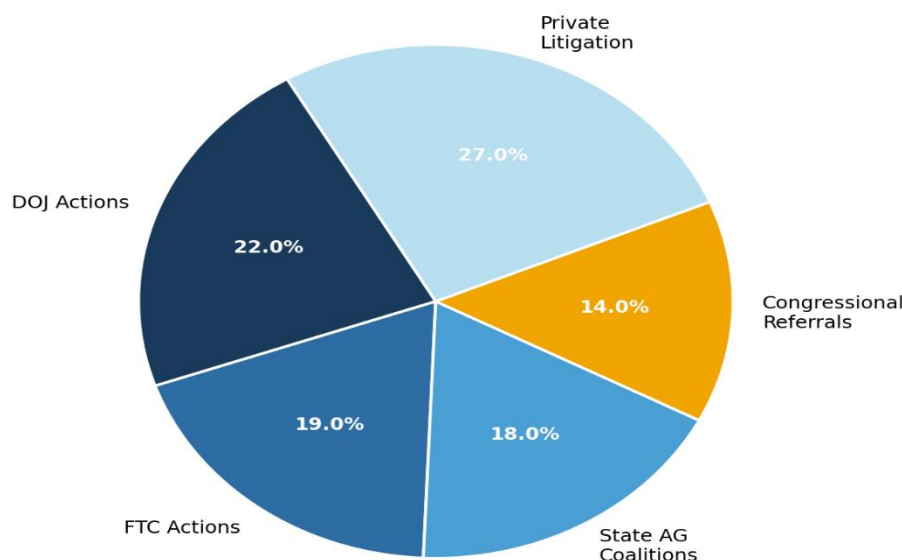


Figure 3. U.S. antitrust enforcement mechanisms against digital platforms (2010-2024). Source: U.S. Department of Justice Antitrust Division; Federal Trade Commission annual reports. Private litigation includes class actions and competitor suits.

3.4 Proposed Legislative Reforms

While there is bipartisan recognition of the dangers of platform power, congressional efforts to reform US antitrust law for the digital age have continually stalled. The American Innovation and Choice Online Act (AICOA), able to go self-preferencing, sponsored by Senators Klobuchar (D-MN) and Grassley (R-IA)] In addition, as reported above, this would have imposed similar prohibitive Structural individual obligation for covered platforms not to offer Self-overlapping products or services in search results A structural complement that is analogous of the literal provisions on gatekeepers as laid down in GMS and OAN. In addition, the Open App Markets Act would have mandated that both iOS and Android allow for different app stores and payment services. Neither bill received a floor vote, due to continued Congressional gridlock over the conflict between heavy lobbying by dominant tech firms and differing views on how best to regulate structural harms within the American constitutional order (Waller, 2022).

4. The European Union: The Digital Regulatory Vanguard

4.1 TFEU Articles 101 and 102: The Competition Law Framework

EU competition law is based on Articles 101 and 102 of the Treaty on the Functioning of the European Union (TFEU). Article 101 prohibits agreements between undertakings that may affect trade between Member States and that have the object or effect of preventing, restricting or distorting completion within the internal market. Specifically, Article 102 declares the abuse of a dominant position by one or more undertakings to be incompatible with the internal market and includes a non-exhaustive list of qualifying acts: (i) imposing unfair prices; (ii) limiting production; (iii) applying dissimilar conditions to equivalent transactions; and (iv) making conclusion of contracts subject to supplementary obligations which have no connection with the subject of those contracts. Competition law in the EU is mainly enforced by the European Commission's Directorate-General for Competition (DG COMP) as the lead enforcement agency with some parallel competences resting with national competition authorities (NCAs) within all 27 Member States under Regulation 1/2003 (Geradin, 2023).

As far as the amount of fines before courts and the legal theories involved, the EU enforcement record against large platforms 2017-2024 is especially remarkable. Six European Commission decisions (as shown in Table 4

and illustrated in figure six) to impose fines against Google and Meta worth well over €12 billion through late-2023 prove that EU competition law as interpreted by the Commission, upheld by the General Court, and ratified by the Court of Justice of the EU provides a significantly more potent armory for curbing platform exploitation of dominance compared to US anti-trust laws in factually analogous situations.

4.2 The Digital Markets Act (2022)

The Digital Markets Act (the "DMA") ((EU) 2022/1925)), in force since November 1, 2022 and applicable to designated gatekeepers from March 6, 2024, represents the most serious systematic regulatory intervention into digital platform markets anywhere across the globe (European Commission, Editorial date). The DMA creates a new ex ante obligations framework for platforms identified as 'gatekeepers' in terms of financial (€7.5 billion +, global pie growth), end-user (≥ 45 million monthly active end users) and sustainability criteria (more likely or less likely to be entrenched in the near-term).

As of March 2024, the Commission had appointed six gatekeepers: Alphabet (30 services), Amazon (1 service), Apple (3 services), ByteDance (1 service), Meta (43 services) and Microsoft (15 services) by identifying 22 core platform services. Articles 5 and 6 DMA broad obligations on designated gatekeepers. It mandates in the case of a gatekeeper: not to combine data from the core platform service with personal data from other services without consent; not to self-preference its own products in rankings; not requiring business users to use its payment systems or identity services, and prohibiting multi-homing by users or business users. Positive obligations encompass the principle of real time data portability for individuals, interoperability of messaging services, and free access to individual business users' data returned by a covered platform in respect of data generated from them on request (Akman, 2022).

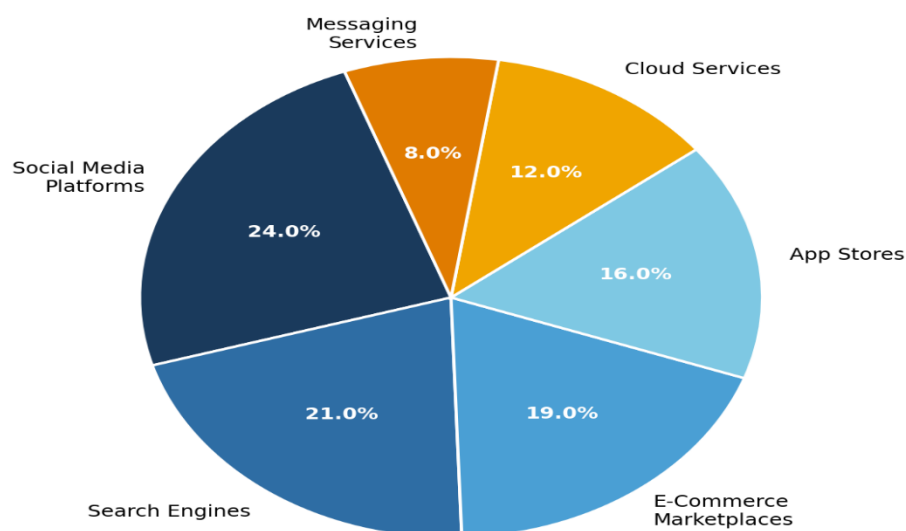


Figure 4. EU Digital Markets Act compliance burden distribution across platform categories (2023). Data based on Commission designation decisions and compliance assessments. Source: European Commission (2023).

4.3 The Digital Services Act and the GDPR Ecosystem

The Digital Services Act (DSA, Regulation (EU) 2022/2065), which is mandatory beginning in February 2024, works in conjunction with the DMA by providing a general liability and due diligence framework for online intermediaries. These obligations are of a staged nature, relative to the size and risk profile of the platform: notice-and-action requirements for hosting services; transparency and content moderation obligations for online platforms; and specific tailored rules such as risk assessment requirement, algorithmic transparency, crisis response mechanisms and annual independent audits by Very Large Online Platforms (VLOPs)/Very Large

Online Search Engines (VLOSEs)(i.e., acting in EU on a monthly active user base exceeding 45 million)28 (European Commission, 2023).

The General Data Protection Regulation (GDPR), applicable since May 2018, establishes the baseline data protection regime against which competition-sensitive data practices are assessed. The fine of €1.2 billion by the Irish Data Protection Commission in May 2023 is the largest fine under GDPR, was from a transfer of European user data to the USA being observed as part of Standard Contractual Clauses entered into by Meta Platforms and at which level the Commission determined US law gave lower levels of protection than those provided under EU law (Täuber, 2022). The issue represented by the restriction of Meta on combining personal data from Facebook and Instagram without valid opt-in consent can be seen as an aspect of digital regulation where EU law has gone further (and more systematically) than any other jurisdiction, namely in the intersection between GDPR and competition law enforcement.

5. India: Constructing a Third Regulatory Model

5.1 The Competition Act, 2002 and the Competition Commission of India

The contemporary competition law framework in India, defined by the Competition Act, 2002 (No.12 of 2003), was enacted after replacing the longer standing Monopoly and Restrictive Trade Practices Act, 1969 (MRTPA) after India's transition post-1991 into a liberalised economy with market based economic management. The Act prohibits anti-competitive agreements (Section 3), abuse of dominant position (Section 4) and mandates notification of combinations above thresholds prescribed for prior approval. The CCI, which became operation and enforced in 2009, has authorities to enforce, investigate and adjudicate approved anti-competitive actions with appeals to the National Company Law Appellate Tribunal (NCLAT) and finally the Supreme Court of India (Indian Parliament, 2002).

Enterprises that are in a 'dominant position' in the relevant market may not abuse their dominance (Section 4 of Competition Act) such as by imposing unfair or discriminatory conditions in purchase or sale, restricting production or technical development without justifiable cause, denying market access and making the conclusion of contracts subject to acceptance of supplementary obligations which have no connection with the subject matter of such contracts or by using a position perceived dominant in one particular market to enter into, protect another. The market investigation and enforcement methodology at CCI has been significantly guided by economic analysis whereby the Commission shows growing sophistication in deploying two-sided market theory and data economics to proceedings against digital platforms (Chaudhry, 2022; Mahajan, 2023).

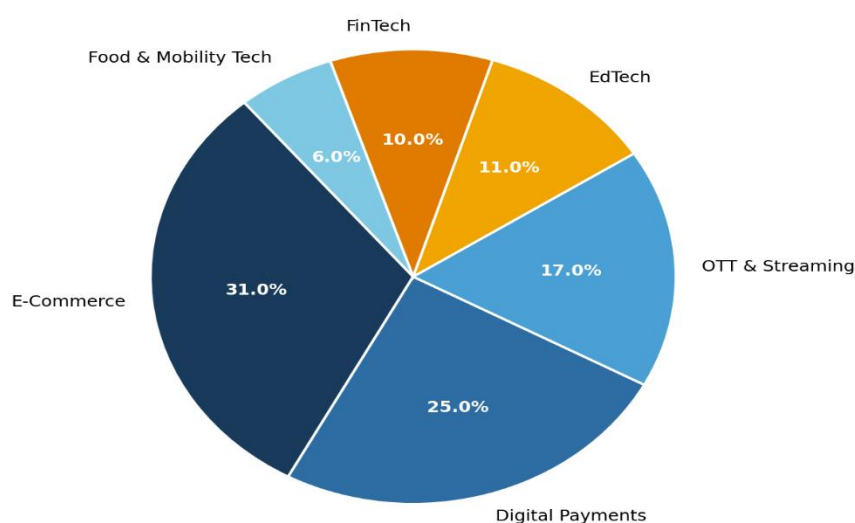


Figure 5. India digital economy revenue distribution by sector (2024). Source: NITI Aayog (2021); Competition Commission of India (2022). Values in approximate proportional share of total digital economy revenues.

5.2 CCI v. Google: Android and Search Dominance

The individual (more significant) assessments on Google LLC and its various partners by way of order dated 25 Oct 2022 by the CCI in Case No. 39 of 2018 represents the most aggressive competition law move in Indian computerized markets up until this point (Competition Commission of India v. Google LLC, [2022] CCI). Breaking down the ruling, the CCI divulged that Google abused its dominant position in the markets for online general web search services (including on mobile), non-operating system mobile device operating systems, app store markets and online video hosting platforms via a combination of mandatory pre-installation agreements, anti-fragmentation obligations forced upon device manufacturers as well as tying of Google Mobile Services to the Play Store coupled with exclusive pre-installation of Chrome as default browser. The CCI order relied heavily on the European Commission's 2018 Android decision, but adjusted the analysis for Indian market realities like how low-cost Android devices are still in many cases the first and only point of internet access for hundreds of millions of first-time Indian internet users. The remedies included a ban on enforcing the preinstallation of Google apps, obligations to allow device makers to form fork versions of Android, an obligation to give users the right to choose their own search engine and behavioural remedies prohibiting tying Google Search with Play Services (Competition Commission of India v. Google LLC, 2022). NCLAT upheld all of these remedies but tweaked the financial penalty on appeal.

5.3 The Digital Personal Data Protection Act, 2023

The President of India assented to the Digital Personal Data Protection Act, 2023 (DPDP Act) on August 11, 2023, creating India's first comprehensive legal and statutory framework for the protection of personal data after nearly ten years of legislative discussion - marked by several drafts since at least the Justice B. N. Srikrishna Committee Report (2018) (Government of India; Ministry of Law and Justice, 2023). The DPDP Act follows a consent-based approach where every 'data fiduciary' (who is someone that determines the purpose and means of processing personal data) must seek free, specific, informed, unconditional and unambiguous consent from its 'data principal (someone whose data is processed), unless in a limited number of legitimate use cases. Large Data Fiduciaries (similar to classification as a very large online platform in the EUVLOP/VLOSE) are required to comply with additional standards, such as data localisation and appointment of an India-based Data Protection Officer, with stricter standards on data retention periods and security. Data Protection Board of India as adjudicatory authority: The DPDP Act establishes the Data Protection Board of India ("Board") as an independent and quasi-judicial board, which has the power to impose monetary penalties up to ₹250 crore (~ USD 30 million) per violation with a maximum of ₹500 crore for systematic infringements. The rights framework of the DPDP Act is more limited than that of the GDPR, excluding for example the right to be forgotten and much weaker rights regarding automated decision-making (Subramanian, 2021), but its regulatory architecture looks surprisingly closely aligned with the GDPR rather than with any pre-DPDP sectoral patchwork it replaces.

5.4 Proposed Digital Competition Act

Informed by the recommendations of a 2022 Parliamentary Standing Committee on Finance report, titled 'Anti-Competitive Practices by Big Tech Companies,' India's Ministry of Corporate Affairs has put forward a draft Digital Competition Act that seeks to implement ex ante regulation targeting Systemically Significant Digital Enterprises (SSDEs), intended on a very explicit mimicry basis from the DMA gatekeeper framework. The law would define SSDEs by revenue, market capitalization and user numbers, and place affirmative obligations on them such as data portability, interoperability, a ban on self-preferencing and even restrictions on engagement practices. If implemented, the proposal would mark a great departure from the pure ex post enforcement model under the Competition Act and would make India only the 3rd major jurisdiction globally to adopt the ex ante regulatory paradigm pioneered by the EU (Srikanth, 2023).

6. Comparative Analysis: Frameworks, Enforcement, and Outcomes

6.1 Jurisdictional Comparison of Regulatory Frameworks

In Table 1, we provide a systematic overview of the main state³ legislative instruments and enforcement bodies in place (general information).⁴ We also outline distinctive characteristics of each jurisdiction that facilitate or impede effective climate adaptation regulatory systems. In this regard, Table 3 provides a rather thorough comparison of the criteria to identify dominant or gatekeeper platforms, and shows that there is wide variation in

thresholds and methods. Figure 6 shows a maturity assessment for five regulatory dimensions, where the EU outperforms both the US and India on specificity of legislative framework and digital market tailoring - while the US retains advantages in terms of enforcement capacity and institutional independence.

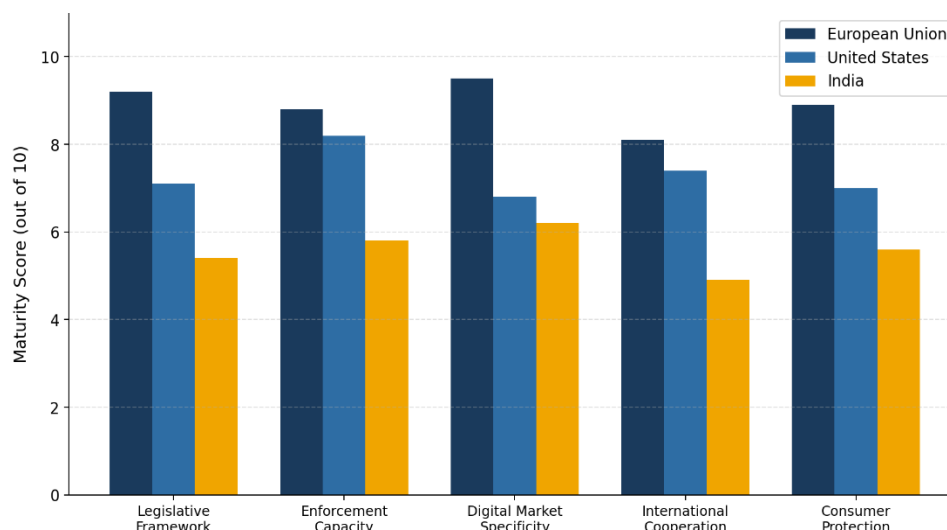


Figure 6. Regulatory framework maturity scores: comparative assessment across five dimensions (0-10 scale). Scoring based on synthesis of Marsden and Podszun (2020); Crémer et al. (2019); Mahajan (2023). Scores represent author assessment informed by cited literature.

Table 1. Comparative Legislative Frameworks for Digital Platform Regulation

LEGISLATION	KEY PROVISION	JURISDICTION	ENFORCEMENT BODY	APPROACH
SHERMAN ACT (1890)	Section 2 monopolization	United States	DOJ / FTC enforcement	Case-by-case common law
CLAYTON ACT (1914)	Anti-merger provisions	United States	DOJ / FTC / Private suits	Structural analysis
TFEU ARTS. 101-102	Abuse of dominance + cartels	European Union	European Commission DG COMP	Ex ante + ex post rules
DIGITAL MARKETS ACT (2022)	Gatekeeper obligations	European Union	EC + NCA coordination	Sector-specific regulation
GENERAL DATA PROTECTION REGULATION (2018)	Data privacy enforcement	European Union	Data Protection Authorities	Rights-based framework
COMPETITION ACT, 2002	Section 4 dominance abuse	India	Competition Commission of India (CCI)	Market definition + effects
DIGITAL PERSONAL DATA PROTECTION ACT (2023)	Data fiduciary obligations	India	Data Protection Board	Consent & accountability

LEGISLATION	KEY PROVISION	JURISDICTION	ENFORCEMENT BODY	APPROACH
INFORMATION TECHNOLOGY ACT, 2000 (AMENDED 2021)	Intermediary liability	India	Ministry of Electronics & IT	Safe harbour conditions
AMERICAN INNOVATION AND CHOICE ONLINE ACT (DRAFT)	Self-preferencing ban	United States	DOJ / FTC	Proposed structural remedy
EU AI ACT (2024)	AI system risk tiers	European Union	National market surveillance	Risk-based classification

Note. This table synthesizes primary legislative instruments across three jurisdictions. DMA = Digital Markets Act; CCI = Competition Commission of India; FTC = Federal Trade Commission; DOJ = Department of Justice. Sources: European Commission (2022); Indian Parliament (2002); U.S. Congress (1890, 1914).

6.2 Enforcement Outcomes and Financial Penalties

From the year 2010 to 2024, Figure 7 shows the total regulatory fines imposed on digital platforms by major jurisdictions. That is more than the aggregate of all other jurisdictions taken together (which is around USD 12.4 billion for the EU, relating to the cumulative effects of GDPR enforcement mechanism in word, DMA non-compliance penalties, and Article 102 TFEU proceedings). The US total of around USD 6.8 billion exists because the bulk of antitrust cases are resolved through consent orders, negotiated settlements and private litigation settlement with no or minimal aggregative value attached an intrinsic characteristic of the US antitrust enforcement system which some argue systematically under-captures deterrent value needed to curb conduct by firms whose market capitalizations surpass one trillion dollars (Waller, 2022). The CCI is an active enforcer of India competition law in digital platform markets only recently (since roughly 2018), does not have expansive jurisdiction over cross-border data flows, and has a pecuniary penalty ceiling under Section 27 of the Competition Act (pegged to physical penalties at ten percent of the average relevant turnover for the last three preceding financial years) that may be structurally deficient when it comes to deterrence against infringement by larger multinationals for whom Indian operations are only a minuscule portion of global revenues with India's total enforcement being only USD ~USD 0.9 billion Table 4 breaks down details of the twelve most significant enforcement actions and results in all three jurisdictions.

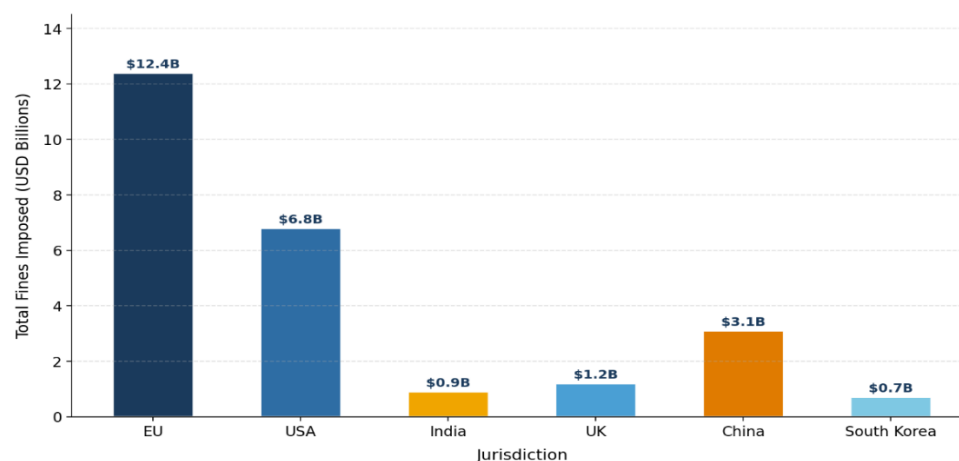


Figure 7. Cumulative antitrust and competition fines imposed on digital platforms by jurisdiction (2010-2024). All values converted to USD billions at contemporaneous exchange rates. Sources: European Commission; Competition Commission of India; U.S. DOJ/FTC; UK CMA; SAMR (China); KFTC (South Korea).

Table 2. Landmark Antitrust Cases Against Digital Platforms (2017-2024)

CASE	ENTITY	YEAR	AUTHORITY	ISSUE	OUTCOME
UNITED STATES V. GOOGLE LLC	Google	2024	DOJ	Search monopoly	Court found Google illegally maintained monopoly in general search
FTC V. META PLATFORMS	Meta	2023 ongoing	FTC	Social media merger	Challenge to Instagram/WhatsApp acquisitions
EU V. GOOGLE SHOPPING	Google	2017	EC	Search self-preferencing	€2.42B fine; landmark abuse-of-dominance ruling
EU V. APPLE APP STORE	Apple	2024	EC	App distribution	€1.84B fine under DMA gatekeeper provisions
EU V. META (DATA PRIVACY)	Meta	2023	DPC/EC	Cross-context data use	€1.2B GDPR fine; data transfer to US scrutinized
CCI V. GOOGLE (ANDROID)	Google	2022	CCI	Pre-installation forcing	₹1337.76 crore fine; behavioral remedy imposed
CCI V. AMAZON/FLIPKART	Amazon, Flipkart	2023 ongoing	CCI	Deep discounting; exclusivity	Section 26(1) investigation ordered
EU V. MICROSOFT (TEAMS)	Microsoft	2024	EC	Bundling	Teams unbundled globally after EC investigation
EPIC GAMES V. APPLE	Apple	2021-2024	US District Court	App Store rules	Mixed ruling; anti-steering provisions enjoined
UK CMA V. GOOGLE PRIVACY SANDBOX	Google	2022	CMA	Cookie deprecation	Commitments extracted before implementation

Note. Cases are illustrative of the major proceedings across the three jurisdictions studied. All financial penalties converted to USD at contemporaneous exchange rates. Sources: Competition Commission of India (2022); European Commission (2017, 2018, 2019, 2023, 2024); United States v. Google LLC (2024).

6.3 Gatekeeper Designation and Threshold Analysis

The criteria for determining which platforms would be subject to enhanced regulatory standards is one of the technically most complicated dimensions of this comparative analysis. The approaches to the above three jurisdictions, therefore, vary greatly as presented in Table 3. The DMA's reliance on numerical thresholds that trigger a rebuttable presumption of gatekeeper status, prioritizing legal certainty and relatively predictably impacts for regulators but undermining its purported aim by excluding impactful platforms beneath the thresholds (and

even capturing platforms not on structurally entrenched positions), The US Sherman Act framework is based on case-by-case judicial determination of monopoly power in a relevant market, which allows for flexibility but also results in high levels of uncertainty and delay that can lead to irreversible anticompetitive consolidation during the course of litigation (Morton et al., 2019).

Table 3. Comparative Gatekeeper and Dominance Designation Criteria

CRITERION	EU (DMA)	US (SHERMAN/CLAYTON)	INDIA (COMPETITION ACT)
MARKET CAPITALIZATION	≥ €75 billion OR turnover ≥ €7.5B in EEA	Not a formal threshold; qualitative analysis	No numeric threshold; CCI uses relevant market share
USER BASE (BUSINESS)	≥ 10,000 yearly active business users in EU	Not applicable (US uses no fixed threshold)	Not defined; CCI assesses market power contextually
END USERS	≥ 45 million monthly active end users in EU	Dominance inferred from 70%+ market share	Dominance ≥ 50%+ market share in relevant market
ENTRENCHED / DURABLE POSITION	Durable entrenchment presumed at thresholds	Monopoly power + willful acquisition required	Substantial market power; considers network effects
SELF-PREFERENCING RULES	Explicitly prohibited under Art. 6 DMA	Illegal under Sherman Act if anticompetitive	Prohibited under Section 4 Competition Act 2002
DATA PORTABILITY	Mandatory real-time portability for gatekeepers	Voluntary (proposed under AICOA)	Proposed under DPDP Act 2023 rules
INTEROPERABILITY	Mandatory for messaging services	Not mandatory	Under discussion in draft e-commerce policy

Note. DMA = Digital Markets Act (EU) 2022/1925; Sherman Act = Sherman Antitrust Act (US) 1890; Competition Act = Competition Act (India) 2002. Threshold data sourced from European Commission (2022); Indian Parliament (2002); U.S. Department of Justice (2023).

Table 4. Major Financial Penalties Imposed on Digital Platforms by Jurisdiction (2017-2024)

CASE	ENTITY	VIOLATION	LEGAL BASIS	PENALTY	YEAR
GOOGLE SEARCH (EU)	Google LLC	Search monopoly	DMA / TFEU Art. 102	€2.42 billion	2017
GOOGLE ANDROID (EU)	Google LLC	Bundling restrictions	TFEU Art. 102	€4.34 billion	2018
GOOGLE ADSENSE (EU)	Google LLC	Third-party ad restrictions	TFEU Art. 102	€1.49 billion	2019

CASE	ENTITY	VIOLATION	LEGAL BASIS	PENALTY	YEAR
META GDPR (EU)	Meta Platforms	Cross-context data use	GDPR Art. 9	€1.2 billion	2023
APPLE APP STORE (EU)	Apple Inc.	DMA non-compliance	DMA Art. 6	€1.84 billion	2024
GOOGLE ANDROID (INDIA)	Google LLC	Forced pre-installation	Competition Act § 4	₹1,337 crore	2022
MAKEMYTRIP (INDIA)	MMT & Goibibo	Platform parity clauses	Competition Act § 3	₹223 crore	2021
DOJ V. GOOGLE (US)	Google LLC	Search distribution agreements	Sherman Act § 2	Remedy pending	2024
FTC V. FACEBOOK (US)	Meta Platforms	Illegal acquisitions	FTC Act § 5	Dismissed/Refiled	2021-23
MICROSOFT TEAMS (EU)	Microsoft Corp.	Bundling with Office 365	DMA	Commitments accepted	2024

Note. All penalties in original currencies; USD equivalents approximate. Govt-EU = European Commission; DPA = Data Protection Authority; CCI = Competition Commission of India; DOJ = U.S. Department of Justice; FTC = Federal Trade Commission. Sources: Competition Commission of India (2022); European Commission (2017, 2018, 2019, 2023, 2024); United States v. Google LLC (2024).

7. Data Monopolization and the Privacy-Competition Nexus

7.1 Data as a Source of Market Power

The notion that extensive proprietary datasets are a source of sustainable competitive advantage and perhaps even a basis for market power has been widely accepted both academically (Graef, 2016; Krämer et al., 2020; Lao, 2022) and in practice. Services that achieve these large user bases create perpetual streams of behavioral data flow to improve service quality (training machine learning models, optimizing ranking algorithms, personalizing recommendations), generate advertising revenue (precisely targeting audiences) and inhibit competitive entry (new entrants cannot replicate the predictive accuracy of incumbents without similar datasets). Calvano et al., (2020) show that algorithmic pricing systems trained on large proprietary datasets can self-coordinate tacit collusion without any explicit link between competing firms a competition law challenge for which existing frameworks have not yet had sufficient time to develop adequate analytical tools.

A good example of the challenge posed by prospective data analysis can be found in the 2014 Decision of the European Commission or MEC, on the merger between Facebook/WhatsApp. The acquisition was cleared by the Commission according to an innovative theory that combining Facebook and WhatsApp user data would not create competitive harm, a conclusion that subsequent developments principally, European enforcement actions against Meta under GDPR for its cross-context data combination practices suggest may have been too permissive of the merger's effects. The merger between Facebook and Kustomer (2021) featured a more nuanced understanding of how data are used to maintain and entrench the power of certain platforms by the Commission in its subsequent analysis.

7.2 GDPR, DPDP Act, and Competition Law Interaction

Data protection law and competition law represents one of the most lively and controversial areas in digital regulation research (Buiten et al., 2020; Renda, 2023). In practice, three models of interaction arose. In this model,

competition authorities regard data protection offences as a discrete area for specialist regulators, and only test whether aggregating certain datasets has any anti-competitive effects (without contesting how the same datasets were obtained or if they should even be combined through consent or purpose limitation frameworks). The second model is based on the premise that competition authorities regard GDPR or equivalent consent obligations as part of the competitive conditions in a market and conclude that platforms with unlawful data processing practices have an unfair competitive advantage over compliant rivals. A prime example of this is provided by the proceedings by Germany's Bundeskartellamt against Facebook, cemented in a 2020 ruling of the Federal Court of Justice (BGH), which found that Facebook's terms requiring users to consent to unlimited aggregation of data as a condition of access to the social network constitutes an abuse within the meaning of Section 19 GWB.

While India's DPDP Act is mainly a consent and accountability tool, it has huge competition law consequences that the CCI has yet to engage with in a systematic fashion. Where dominant platforms make access to their services conditional on consent to laxer data combination practices than those necessary to provide the service, a Section 4 Competition Act claim based on an imposition of unfair conditions is clearly arguable: this is precisely the theory proposed by the Bundeskartellamt. The next set of rules under the DPDP Act, which is likely to be notified in 2024-2025 will hold decisive importance in determining if India would bring data protection enforcement into competition enforcement or keep them as separate but parallel uncoordinated regulatory regimes (Subramanian, 2021).

8. Artificial Intelligence, Algorithmic Systems, and Emergent Regulatory Challenges

8.1 Algorithmic Collusion and Pricing

Digital platform regulation is a distinctly new generation of competition law interrogative that only a handful of existing frameworks are just starting to reconcile with. Algorithmic Pricing: Algorithmic pricing systems programs that automatically adjust prices in real-time by running predefined modelling algorithms and adjusting prices in light of observed competitor prices, demand signals, inventory levels and predictive model inputs are now standard software tools used in platform mediated markets like airline ticketing, hotel accommodation, ride-hailing or online retail. As Calvano et al. Through experiments, (2020) show that with no communication or coordination, reinforcement learning algorithms can reach supracompetitive pricing equilibria that an economist would characterize as collusive, generating harm to consumers which the current prohibitions against cartels (which requires a 'common agreement' or 'concerted practice') simply cannot structurally capture.

The EU has increasingly pushed the boundaries of what can constitute algorithmic collusion under a hub-and-spoke model, treating it as something indirect but nonetheless illegal on its own merit for an Article 101 TFEU violation. The EU AI Act (2024) creates a risk-based classification system for systems of artificial intelligence and defines algorithmic systems used in employment, credit scoring, critical infrastructure and law enforcement as high-risk categories requiring an assessment of conformity, including human oversight. An unanswered question, which scholars such as (Gal 2021) and Renda (2023) are only beginning to tackle, is the extent to which competition-sensitive algorithmic pricing systems hit upon any risk within the AI Act's outlined framework.

8.2 Generative AI and Platform Concentration

The unprecedented speed of development of generative artificial intelligence systems (e.g. large language models, image generation models, and multimodal systems that can produce text/content, code, images/content + audio and video content) has created a new category of platform concentration risk that existed regulatory frameworks catered for poorly if at all. 2. Generative AI, which creates text and other content at a level of scale that independent AI cannot offer (competition implicitly hampered), integrated in-to platform products: Google's AI Overviews in search; Meta's integration of 'AI assistant' in WhatsApp and Instagram; Microsoft situating Copilot into every Office 365 product; Amazon upgrading Alexa to an AI.

While the CCI has started paying attention to digital markets in India seen through its Market Study on the Telecom Sector (2022) and proposed amendments to the Competition Act seeking a change of guard vis-a-vis digital markets it is yet to systematically tackle generative AI risks. The EU's DMA designation proceedings do not presently designate AI models or AI assistants as core platform services, although some academic commentary has suggested considering the regulation of future gatekeepers for AIs to help restrain such multi-faceted harms as these markets mature (Renda, 2023). The opportunity for AI systems to become gatekeepers at the infrastructure

layer between knowledge access, professional advice, creative production, and education is an urgent area of comparative legal analysis that future research should pursue.

9. Policy Synthesis and Recommendations

9.1 Toward a Convergent Regulatory Architecture

The international comparison in this paper shows a world regulatory landscape that is largely harmonised as to ultimate goals of contestability, fairness, innovation and consumer welfare but diverse as to means, thresholds and approach to enforcement. The resulting divergence creates both substantive issues (regulatory arbitrage, forum shopping, and inconsistent treatment of the same platform conduct) and procedural inefficiencies (parallel proceedings, duplicative compliance burdens, and conflicting orders). Again, with a special emphasis on coordinated designation for gatekeepers, data-sharing frameworks and joint investigation protocols, the OECD (2021, 2023) has made a strong case for further international cooperation.

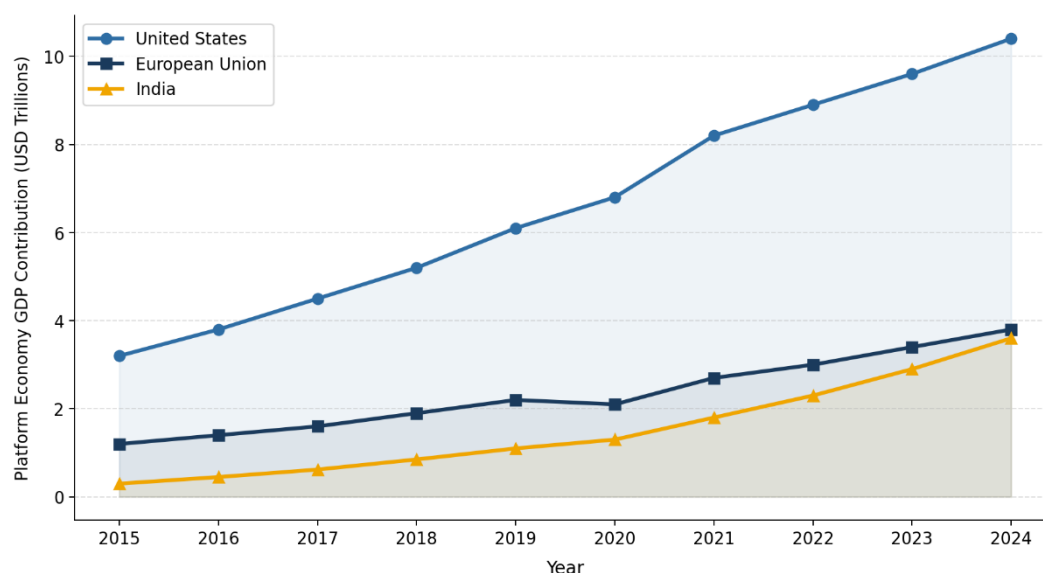


Figure 8. Platform economy growth trajectory by jurisdiction (2015-2024), measured by estimated GDP contribution of platform-mediated transactions (USD trillions). Sources: OECD (2023); International Monetary Fund (2023); NITI Aayog (2021). India right-scale adjusted for purchasing power parity.

9.2 Recommendations for the United States

U.S. law should mandate ex ante behavioral requirements for big platforms, just not lose the benefits of case-by-case antitrust enforcement. The self-preferencing prohibition included in the AICOA needs to be implemented at a minimum, combined with compulsory data portability and interoperability requirements that decrease multi-homing costs for users but also business users. Introduction Merger review standards regarding digital acquisitions should include a dynamic, probabilistic analysis of future competitive significance for nascent targets the so-called 'killer acquisition' problem (Morton et al.). (2019) and thoroughly explored in the Stigler Center (2019) and Furman et al. (2019) reports. Substantial enhancement of FTC and DOJ resources for enforcing digital market competition should cause them to have caseload capacities at least as high as those enjoyed by the European Commission's DG COMP.

9.3 Recommendations for the European Union

The EU's DMA framework is the most systematically sophisticated of its kind in the world, but it must still be implemented and enforced effectively. The Commission should: explicitly define how to assess compliance with interoperability obligations for messaging services (Articles 6(1)(f) and 7), where designated gatekeepers disputed the technical details up until the end of the first quarter in 2023; ensure a timely designation process for AI-mediated core platform services, so there is no gap in regulatory coverage as generative AI will be embedded into platform architectures; consolidate mechanisms of cooperation with Member State NCAs to ensure effective enforcement throughout the internal market (Marsden & Podszun, 2020; Geradin, 2023).

9.4 Recommendations for India

The regulatory architecture of India stands at a crossroads today. A Digital Competition Act as proposed should be enacted but with SSDE thresholds that are very finely and sensitively calibrated to the Indian conditions of 2003 including especially giving due weight to the role played by multinationals as providers to consumers who may have no possible substitutes, more appropriate standards for data localization in the equity context than a safe harbor, and how valuable it is to enterprise development at this dynamic moment that an Indian digital entrepreneurial space be preserved. There is a rich pool of guidance derived from views issued by the European Commission and academic sources, which should be used to create explicit methodological guidelines for the CCI on digital market definition, data network effects and zero-price market analysis. The Data Protection Board under the DPDP Act: would, however, need to formalise a coordination mechanism with the CCI for covering cases involving an overlap of data protection and competition issues (Mahajan, 2023; Srikanth, 2023).

10. Conclusion

This article provided a detailed comparative legal analysis of digital platform regulation across three of the world's most important regulatory jurisdictions (the USA, EU and India) and looked at the ways that traditional antitrust doctrine, competition law design, data protection frameworks and new forms of digital-specific legislation will or ought to interact. This analysis shows that while the individual jurisdictions have developed unique regulation approaches shaped by their contrasting constitutional structure, institutional capacity, market realities, and political economy much of the goals of competitive markets (where possible), preserving innovation incentives, deterring concentration in unaccountable private power over economic and social activity are widely shared.

The DMA is the most pro-active and systematically build response to the special economic features of digital platform markets, providing for an ex ante obligations regime rooted in clearly defined needs that follow from antitrust law's fundamental inability to undo competitive harm that cannot be undone once inflicted on a market. The consumer welfare standard and the slow-moving machinery of courts have led to landmark enforcement successes in the U.S. antitrust tradition -most noticeably with the 2024 Google decision - but this does NOT include such a regulatory architecture that could identify structural competition risks arising from platform consolidation in the era of AI. India, on the other hand, is selectively borrowing from both sets of traditions but progressively carving out a regulatory model which might ultimately be most relevant to the (largely) developing mass of Global South jurisdictions grappling with similar dilemmas.

The promise of digital entrepreneurship will be underpinned by more than access to capital and technical skills, however we need regulatory conditions that promote market contestability, avoid foreclosure of distribution channels, and ensure the neutrality of platform intermediaries so they act as true neutral infrastructure, rather than vertically-integrated players who provide both marketplace supply and agency over the competition. While the three jurisdictions have each achieved substantial degrees of these goals, until that rigour is present no jurisdiction has yet implemented a regulatory architecture commensurate to the size of the problem. The combination of artificial intelligence, generative models and platop infrastructure demands a level regulatory innovativeness to match if not surpass the urgency that preceded the passage of the Sherman Act over 100 years ago. This paper is one contribution in what is a necessary comparative legal scholarship to inform the policy debates that will ultimately shape whether the digital economy becomes a force for inclusive prosperity or a mechanism of wealth concentration through platform-mediated extraction.

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