BIG DATA AND TECH DOMINANCE: REGULATION THROUGH COMPETITION LAW

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"The flow of data is crucial to the well-being of companies in a data-driven economy, but needs, nevertheless, to be reconciled with other interests in order to maximize the social welfare."[1]

- Sofia Oliveira Pais

ABSTRACT

The rapid growth of digital platforms and data-driven business models has transformed global markets. Large technology companies increasingly derive their market power from their ability to collect, process, and monetize massive volumes of data. This concentration of data creates significant barriers to entry, strengthens network effects, and enables dominant firms to entrench their positions across multiple markets. Traditional competition law frameworks, designed primarily for price-based markets, often struggle to address these developments because many digital services are offered for free while competition occurs through data acquisition, innovation, and user attention.

This paper examines the relationship between big data and market dominance in the digital economy. It analyzes how data concentration contributes to anti-competitive conduct, including exclusionary practices, predatory acquisitions, self-preferencing, and exploitative data collection. The paper further evaluates how competition authorities in different jurisdictions, particularly the European Union, the United States, India, and the United Kingdom, are adapting legal frameworks to regulate dominant digital firms.

The paper argues that competition law remains one of the most important regulatory tools for controlling the power of large technology firms, but it must evolve to address the unique characteristics of data-driven markets. New approaches such as ex ante regulation, interoperability mandates, data portability, and stronger merger scrutiny are necessary to preserve competition in the digital economy.

Keywords: Big Data, Competition Law, Digital Markets, Market Dominance, Data Monopolies, Antitrust, Digital Platforms.

1. BACKGROUND

With the fast-paced development of technology, the world market is no longer based only on the demand for tangible goods. Data circulation has resulted in the development of new business models, target customers, and digital products, ushering in a new information era. In the age of digital markets, data has an essential role in developing and maintaining a successful business. Firms have built an entirely new digital economy[1] in which they thrive and compete. The business of certain online platforms is so reliant on data gathering and analysis, that the marketplaces in which they operate have been characterized as data-driven markets. Markets for social networks, search engines, online advertising and e-commerce are regarded as data-driven markets where the utilization of Big Data is required for organizational survival. One prominent example of a data-driven market is the market for general online search, such as Google, whose business model is almost entirely based on the collection of user data and its monetization through cutting-edge online advertising.

In the digital market, certain online services are provided for free, so consumers have no monetary cost. Such products or services are called zero-price products. For example, one can use Google without paying any fees. However, in reality, the consumer pays a lot to use these goods free of cost. Indeed, the ***"data can be worth up to $5000 per person per year to advertisers."***[2] Therefore, in the digital age, the currency is not money but data[4] and the user is a consumer as well as the product.

In the digital economy, data collection and processing appear to be an entrepreneurial activity with significant implications for a company's competitive performance. The vast amount of data generated in the digital space is commonly referred to as 'Big data.' Big data is a term that describes a large volume of structured, semi-structured and unstructured data that has the potential to be mined for information and used in machine learning projects and other advanced analytics applications. It is commonly understood as the use of large-scale computing power and technologically advanced software in order to collect, process and analyze data characterized by a large volume, velocity, variety and value. It is a theme of multi-

[1] Digital economy is an umbrella term used to describe markets that focus on digital technologies. It typically involves the trade of data, services or goods through electronic commerce as a medium. Refer to Organisation of Economic Co- operation and Development (OECD), The Digital Economy (Feb. 7, 2013), http://www.oecd.org/daf/competition/The- Digital-Economy-2012.pdf.

[2] Nathan Newman, The Costs of Lost Privacy: Consumer Harm and Rising Economic Inequality in the Age of Google, 40(2) William Mitchell Law Review 849, 865-866(2014)

disciplinary interest and many scientific research areas such as computer science, business administration, law, economics, etc. are studying its implications.

Big data and analytics can lead to substantial reductions in costs for businesses and the global market revenues for big data and business analytics had an estimated value of $171.39 billion in 2018, rising to a potential $512.04 billion by 2026.[3] In 2011 McKinsey Report noted that ***"using big data will become a key basis of competition for existing companies,"[4] and "the use of big data will become a key basis of competition across sectors, so it is imperative that organizational leaders begin to incorporate big data into their business plans."[5]*** Similarly, the Organisation for Economic Co- operation and Development (OECD) has observed that ***"big data now represents a core economic asset that can create significant competitive advantage for firms."[6]***

Big Data explains why and how data became such an important component of today's data-driven markets, and it fosters an understanding of data-driven business models in which data confers significant competitive advantages. The emergence of data as a key competitive advantage in the digital market raises new challenges to the traditional competition framework. This leads to a discussion on the role of competition law in the data-driven era, which is integrated into a broader debate about the new processes of value generation and capture in the era of digital capitalism and the complex economy it has created. While innovation in data-driven markets is generally desirable, the use of Big Data appears to have the potential to lead to the entrenchment of a dominant position, increase market concentrations and act as a barrier to entry.

As more businesses adopt data-driven business strategies and mergers, competition regulators and courts will have to deal with the competitive consequences of Big Data. They cannot afford to ignore Big Data because data-driven business models have serious consequences for privacy, consumer protection, and competition law. The potential harm of data-driven

[3] Valuates Reports, Big Data and Business Analytics Market Size is Projected to Reach USD 512.04 Billion by 2026, Bloomberg Business (11 February 2020), https://www.bloomberg.com/press-releases/2020-02-11/big-data-and-business-analytics-market-size-is-projected-to-reach-usd-512-04-billion-by-2026-valuates reports
[4] James Maniyika et al., Big Data: The Next Frontier for Innovation, Competition, and Productivity, Mckinsey Global Institution, 13(2011), https://bigdatawg.nist.gov/p2df/MGI_big_data_full_report.pdf
[5] Id. 111
[6] OECD, Supporting Investment in Knowledge Capital, Growth and Innovation, OECD Publishing, 319 (October 2013), https://lisboncouncil.net/wp-content/uploads/2020/08/OECD-Supporting-Investment-in-Knowledge-Capital- Growth-and-Innovation.pdf

mergers and abuses of dominant companies built on data is too significant to overlook or downplay.

The objective of this research work is to explore how competition law might play an important role in capturing the benefits of a data-driven market while limiting its associated risks. Big Data is neither essentially good, bad, nor neutral. Its social worth is determined by the industry, as well as the objective and impact of the data-driven strategy. The goal of this research work is to analyse the consequences of a data-driven market for competition policy.

2. SIGNIFICANCE OF STUDY

Big Data is one of the most contentious issues in contemporary competition law. Its constant rise in our world and the effects of numerous digital platforms complicate traditional market dynamics. While the collection and use of personal data fall under the purview of data protection laws, several competition law regulators around the world are now investigating whether the use of Big Data can impact market competition. In the Indian context, backed by Big Data innovation technology-driven markets such as e-commerce, ride-hailing apps, online wallets, etc. have been growing rapidly and witnessing a progressive surge in merger and acquisition activities along with data-related abusive practices, potentially exposing such markets to competition law concerns. Therefore, it is high time to conduct a study on whether the issue of Big Data is a big deal in ensuring the competitive nature of data-driven markets and this research work is a part of a larger public debate over whether modern competition policy should be updated for the age of digitalization and Big Data.

3. LIMITATIONS

This research work aims to analyze whether the current framework of competition law is appropriate to deal with theories of harm related to Big Data, identify residual problematic points, and discuss possible solutions. For the purpose of this research work, the term 'online platforms will cover search engines, social networks and e-commerce platforms. The term 'data' simply refers to 'digital data' which can be understood as records of various input collected by undertakings that contain 'machine-readable encoded information.'[7] Moreover, due to the legal nature and limited capacity of the dissertation, no technical distinction between

[7] Josef Drexl, Designing Competitive Markets for Industrial Data – Between Prophetization and Access, 8 JIPITEC 257, (2017)

raw data and analyzed data will be made. It should be noted, nonetheless, that such distinction might be desirable for applying the existing competition law framework to data. For simplicity of this research work, the term 'data' will refer to both the data itself and the information that can be retrieved from it and it will also include personal data, which is generally defined as ***"any information relating to an identified or identifiable individual (data subject).***"[8] It will focus on the following "list of personal data provided by the Organization for Economic Co-operation and Development:

- User-generated content, including blogs and commentary, photos and videos, etc.
- Activity or behavioral data, including what people search for and look at on the
- Internet, what people buy online, how much and how they pay, etc.
- Social data, including contacts and friends on social networking sites.
- Locational data, including residential addresses, GPS, and geo-location from mobile phones, IP addresses, etc.
- Demographic data, including age, gender, race, income, sexual preferences, political affiliation, etc.
- Identifying data of an official nature, including name, financial information and account numbers, health information, national health or social security numbers, police records, etc.

4. RESEARCH OBJECTIVES

The main objectives of this research are:

- To study the role of data in the digital economy.
- To understand the concepts of Big Data and its impact on competition in data-driven

[8] OECD, Exploring the Economics of Personal Data: A Survey of Methodologies for Measuring Monetary Value, OECD Digital Economy Paper No 220, 7 (2013), https://doi.org/10.1787/5k486qtxldmq-en

markets.

- To address the concerns of competition regulatory authorities in defining the relevant market for Big Data in the digital economy.

- To analyze various methods to determine market power and assessment of the dominant position in data-driven markets.

- To examine the legal landscape regulating Big Data related anti-competitive practices, abuse of dominant position and mergers in data-driven markets across various jurisdictions around the world.

- To provide suggestions and modifications that are to be made in the current competition policy to address the needs of data-driven markets.

5. RESEARCH QUESTIONS

The following are the research questions formulated by the researcher:

- What is Big data and its role within a competition context?

- What is the role of data in the digital economy? Does data create competitive advantages?

- Whether the existing competition framework is still an adequate tool to assess the relevant market for Big Data, dominance and acquisition of market power in data-driven markets?

- What are the potential implications of abuse of dominance by Big Tech firms in data-driven markets?

6. RESEARCH HYPOTHESIS:

The following hypothesis has been tested under the current study:

- Use of Big Data by data-driven companies can confer them with market power and a competitive advantage over their competitors.

- Data-driven abuse of dominance and mergers have a significant impact on competition in the digital economy.

- Adapting current competition laws and tools to address the challenges posed by Big Data with some modifications is a good structural and regulatory approach.

7. RESEARCH METHODOLOGY

The study is purely doctrinal or non-empirical with the analysis based on primary data sources, inter alia legislations and judicial precedents of India, China, the European Union, Germany, the USA and the United Kingdom. In the proposed study secondary sources like books, legal journals, articles and web sources will also be employed. The Researcher will refer to various statutory laws, notifications, compendiums and case laws relevant to the topic. The study will be analytical and descriptive in nature.

8. REVIEW OF LITERATURE

A review of the academic literature addressing the intersection of Big Data and competition law indicates relatively few articles and books on the topic. Scholars are yet to perform a comprehensive examination of why Big Data concerns constitute competition policy-related issues.

The book **'Big Data and Competition Policy'**[9] written by **Allen P. Grunes and Maurice E. Stucke** explores the rise of the data-driven markets, led by the development of data analytics and the ability to aggregate an ever-increasing amount of data, evaluates competition authorities' relatively weak track record in this field and gives explanations for this lack of attention while addressing the implications to consumers and the economy if competition authorities neglect big data.

The article, **'No mistake about it: The important role of antitrust in the era of big data'**[10] authored by **Allen P. Grunes and Maurice E. Stucke** provides that data plays a major role

[9] Allen P. Grunes & Maurice E. Stucke, Big Data and Competition Policy (Oxford University Press, 2016).
[10] Allen P. Grunes & Maurice E. Stucke, No Mistake About It: The Important Role of Antitrust in the Era of Big Data, The University of Tennessee College of Law Research Paper No. 269 (2015), https://papers.ssrn.com/so13/papers.cfm?abstract_id=2600051

in the strategic decisions of several companies. The companies are determined to acquire a data advantage over their rivals. Data-driven mergers are becoming more common, and these data-driven corporate strategies and mergers have greatly increased the implications of privacy laws, consumer protection laws, and competition laws.

The article, 'The implications of big data and privacy on competition analysis in merger control and the controversial competition-data protection interface'[11] authored by Maria C. Wasastjerna examines the implications of big data for competition law, with a particular emphasis on personal data and privacy concerns. It highlights the significance of data and privacy in competition law, particularly in the area of merger control, given the volume of data-driven acquisitions in digital markets.

The article, **'Digital Economy & Competition Law: A Conundrum'** authored by **Aryan Mohindroo and Rajat Mohindroo** deliberated that the digital economy impacts competition law in the light of search engines, social media platforms, and e-commerce platforms. It states that the possibilities of firms in the digital economy engaging in anti-competitive practices are just as likely as in the brick and mortar or the traditional economy. It further discussed competition law challenges posed by these platforms from an Indian perspective.

The article, '**Exploitative abuses in digital markets: Between Competition Law and Data Protection Law'** authored by **Miriam Caroline Buiten** considers how we can conceptualize exploitative abuse of dominance cases in zero-price markets. The article calls into question if data protection laws should play a role in anti-trust abuse assessments. The article argues that, even in digital markets that unequivocally link market power with data privacy concerns, competition law and data protection law have complementary but distinct roles to play.

9. Meaning and Importance of Big Data

Big data refers to extremely large and complex datasets that can be collected, processed, and analyzed to reveal patterns, trends, and associations. Big data is generally characterized by the "five Vs":

- Volume – the vast amount of data generated.

[11] Maria C. Wasastjerna, The implications of big data and privacy on competition analysis in merger control and the controversial competition-data protection interface, 30(3) European Business Law Review 337 (2019)

- Velocity – the speed at which data is produced and processed.
- Variety – the different forms of data, including text, video, images, and transactional records.
- Veracity – the reliability and accuracy of data.
- Value – the economic and commercial usefulness of data.

Technology companies rely heavily on big data because it allows them to improve products and services. Search engines can deliver more relevant results, social media platforms can personalize feeds, and e-commerce companies can recommend products based on previous purchases.

Data-driven firms benefit from feedback loops. More users generate more data; more data improves the quality of services; better services attract more users. This self-reinforcing cycle strengthens market dominance and makes it difficult for smaller competitors to survive.

10. Big Data as a Source of Market Power

I. Network Effects

Network effects occur when the value of a service increases as more users join it. Social media platforms are classic examples because users are more likely to use a platform that already has a large user base. When combined with data accumulation, network effects create strong barriers to entry.

For example, a dominant search engine benefits from more search queries, which improve its algorithm. A new entrant with fewer users cannot generate comparable data and therefore cannot compete effectively.

II. Economies of Scale and Scope

Large technology firms benefit from economies of scale because they can collect and process data at lower costs than smaller firms. They also benefit from economies of scope because data collected in one market can be used to strengthen their position in another.

For instance, a company that collects data through email services may use the same data to improve targeted advertising, cloud computing, or digital assistants. This ability to leverage data across multiple services enhances market power.

III. Switching Costs and Lock-In Effects

Consumers often face switching costs when they attempt to move from one platform to another. These costs may include the loss of contacts, digital history, purchased content, or personalized settings.

Dominant firms exploit switching costs by integrating their services across multiple platforms. For example, a user deeply embedded in a particular ecosystem may find it difficult to switch because doing so would require changing devices, applications, storage systems, and subscriptions.

IV. Data as an Entry Barrier

Data itself can function as an entry barrier. New firms may lack access to the volume and quality of data necessary to compete effectively. In markets such as online advertising, ride-sharing, and digital payments, firms with larger datasets can make better predictions and improve user experiences.

Consequently, data concentration can create a "winner-takes-all" market structure where a few dominant firms control most of the market.

11. Anti-Competitive Practices by Dominant Technology Firms

i. Self-Preferencing

Self-preferencing occurs when a dominant platform favors its own products or services over those of competitors. For example, a search engine may rank its own services more prominently than rival services.

This practice can distort competition because consumers are directed toward the dominant firm's offerings even when competitors may provide better alternatives.

ii.Predatory Acquisitions and Killer Acquisitions

Large technology companies often acquire smaller firms before they become significant competitors. These acquisitions are sometimes called "killer acquisitions" because they eliminate future competition.

Examples include Meta's acquisition of Instagram and WhatsApp, and Google's acquisition of YouTube and DoubleClick. Competition authorities increasingly scrutinize such mergers because they may reduce innovation and entrench dominant positions.

iii. Exclusive Agreements and Bundling

Dominant firms may enter into exclusive agreements with manufacturers, advertisers, or app developers to prevent rivals from accessing markets. They may also bundle products together in ways that force consumers to use multiple services.

For example, a dominant operating system provider may pre-install its own browser, search engine, or application store, making it harder for competing services to gain visibility.

12. Competition Law Approaches to Digital Dominance

i. European Union

The European Union has taken one of the most aggressive approaches toward regulating digital markets. The European Commission has imposed major fines on Google for abuses related to shopping search results, Android licensing, and online advertising. The EU has also introduced the Digital Markets Act (DMA), which imposes obligations on "gatekeeper" platforms. The DMA prohibits practices such as self-preferencing, restrictive app store rules, and barriers to interoperability. The General Data Protection Regulation (GDPR) also complements competition law by limiting the ways firms can collect and process personal data.

ii. United States

The United States traditionally adopted a narrower approach to antitrust law, focusing primarily on consumer welfare and price effects. However, recent developments show a shift toward stricter scrutiny of digital platforms. Cases against Google, Meta, Apple, and Amazon reflect growing concerns about monopolization, anti-competitive mergers, and exclusionary

conduct. Policymakers are increasingly questioning whether existing antitrust standards are sufficient for the digital economy.

iii. United Kingdom

The United Kingdom has established a Digital Markets Unit (DMU) within the Competition and Markets Authority. The DMU focuses on firms with "strategic market status" and has the authority to impose conduct requirements and promote fair competition. The UK model emphasizes proactive regulation rather than relying solely on lengthy litigation after anti-competitive conduct has already occurred.

iv. India

India has emerged as an important jurisdiction in the regulation of digital markets. The Competition Commission of India (CCI) has investigated Google for abuse of dominance in the Android ecosystem and the Play Store market. The CCI has also examined issues relating to WhatsApp's privacy policy, Amazon's preferential treatment of sellers, and app store practices. India's growing digital economy makes competition law particularly important because a few dominant firms increasingly control online search, social media, e-commerce, and digital payments.

13. Key Challenges in Regulating Big Data Through Competition Law

a. Defining Relevant Markets

Competition law requires authorities to define the relevant market before assessing dominance. However, defining markets in the digital economy is difficult because many services are offered for free and platforms often operate across multiple markets simultaneously.

For example, a company may function as a search engine, advertising platform, cloud provider, and hardware manufacturer at the same time.

b. Measuring Consumer Harm

Traditional antitrust analysis focuses on higher prices and reduced output. In digital markets, harm may occur through lower quality, reduced privacy, diminished innovation, or restricted

consumer choice. Authorities therefore need broader measures of consumer harm that account for data exploitation and reduced competition.

c. Rapid Technological Change

Technology markets evolve rapidly, while legal proceedings often take several years. By the time a competition authority reaches a decision, the market may have changed significantly. This makes it necessary to adopt faster and more flexible forms of regulation.

d. Balancing Innovation and Regulation

Excessive regulation may discourage innovation and investment. Technology firms often argue that data-driven practices are necessary to improve products and deliver free services. Regulators must therefore strike a balance between preventing anti-competitive conduct and preserving incentives for innovation.

14. Recommendations

To address the challenges posed by big data and tech dominance, competition law should evolve in several ways:

- Stronger merger review should be adopted to prevent killer acquisitions.
- Competition authorities should consider data concentration as an indicator of market power.
- Interoperability and data portability obligations should be imposed on dominant platforms.
- Authorities should adopt broader standards of consumer harm that include privacy and innovation.
- Ex ante regulation should complement traditional antitrust enforcement.
- Competition authorities should coordinate more closely with data protection regulators.
- Digital platforms should be required to provide greater transparency regarding

algorithms and data practices.

15. Conclusion

Big data has become one of the most important sources of economic power in the digital economy. Large technology firms derive significant advantages from their ability to collect, analyze, and exploit user data. This concentration of data strengthens network effects, creates entry barriers, and enables firms to dominate multiple markets.

Traditional competition law frameworks are often inadequate because they focus on price-based harms rather than data-driven forms of market power. However, competition law remains an essential tool for addressing digital dominance.

Jurisdictions such as the European Union, the United Kingdom, the United States, and India are increasingly adapting their laws to address the challenges posed by big data and dominant digital platforms. Measures such as stricter merger control, interoperability requirements, data portability, and ex ante obligations are likely to play an important role in the future.

Ultimately, the goal of competition law should be to preserve fair competition, protect consumer choice, and prevent excessive concentrations of economic power in the digital age.

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