

Platform Economies and Market Power: Evidence from Digital Markets

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Abstract

The fast development of digital technologies and the rise of platform economies through digital platforms that enable interaction between several parties and generate value via network effects, data, and AI is revolutionizing the markets in the modern world. Although digital platforms contribute substantially to innovation and efficiency in markets, they have been criticized for generating issues associated with market concentration, entry barriers, and dominance of a limited number of large global tech corporations. In this review, I focus on the economic underpinnings of platform markets, sources of market power, measurement methods of digital dominance, empirical evidence from the major digital industries, competition policies and regulations implemented in leading economies, and gaps in research and future avenues. Market power in digital markets is more complex than it was before and depends not only on pricing but also on the control of data, integration into ecosystems, and AI. Therefore, assessment of competition in such markets must be done using multidimensional frameworks reflecting the specifics of platform markets.

Keywords

Platform Economy, Digital Platforms, Market Power, Competition Policy, Network Effects, Digital Markets

1. Introduction

The ongoing digitalization process of economic operations has significantly changed the structure of markets of the modern time. It gave rise to an entirely new economic paradigm called the platform economy. Digital platforms have turned from being mere online intermediaries into ecosystems coordinating in-

interactions between consumers, companies, advertisers, software developers, service providers, etc. with the help of data-driven technologies. Modern companies such as Google, Amazon, Apple, Meta, Microsoft, Alibaba, and Uber play a crucial role in global commerce, communication, financial sector, transport industry, and other digital services. Platform-based business models become one of the hallmarks of the twenty-first-century economy (Evans and Schmalensee, 2016; Kenney and Zysman, 2016; Parker, Van Alstyne, and Choudary, 2016; Rochet and Tirole, 2003). The unprecedented growth of digital platforms brought changes to the structure of industries, competition, consumer behavior, etc., at the same time raising serious questions about market concentration and economic power.

First of all, unlike the previous pipeline-oriented firms creating value through production and sales of goods and services, modern digital platforms create value through interactions of several user communities (Evans, 2003). Rochet and Tirole (Rochet and Tirole, 2003) proposed the concept of two-sided markets, proving that platforms act as intermediaries linking different user groups and internalizing network externalities between them. Evans (Evans, 2003) emphasized that the platforms of modern times became matchmakers reducing transaction costs, facilitating the exchange of information and value co-creation, but not product production anymore. Thus, the shift from production to interaction-oriented business models caused the change of competition in digital markets.

One of the distinctive features of digital platforms is the existence of network effects which cause the increase in value provided by a platform due to the increase of its users. The first kind of these effects is direct network effects when the benefit from belonging to community grows when the community grows. The second kind of network effects is indirect ones meaning that the increase of number of users on one side of the platform leads to the growth of value created by users from the other side. These feedback mechanisms are known to cause the emergence of increasing returns to scale and highly concentrated market structure in which only several dominant firms have a significant share of economic activity (Katz and Shapiro, 1985; Rochet and Tirole, 2003). Along with low marginal costs of serving additional users, the mentioned characteristics contribute to rapid international expansion of successful digital platforms.

Another distinctive feature of the platform economies is the significance of data in business. Each interaction of users creates information about their preferences, purchases, mobility, searches, social interactions, etc. Those proprietary databases make machine learning algorithms of recommendation systems, targeting of advertising, search ranking, fraud prevention, and provision of personalized services better and better. Thus, data have become a crucial economic asset increasing the competitive advantages and imposing entry barriers for rivals (Varian, 2018). With more and more users, platforms collect rich data that improve the quality of service and make market leaders even stronger via feedback loops.

The rapid growth of digital platforms raised the issue of market power in digital markets. Traditional measures of competition, such as market shares or prices,

are not sufficient for the evaluation of the market power in markets where many services are provided without monetary cost, and the competition is based on innovation, data, user attention, privacy, and control over ecosystem rather than only on price (Crémer, De Montjoye, and Schweitzer, 2019). Dominant platforms could become even stronger through data accumulation, artificial intelligence, switching costs, ecosystem integration, self-preferencing, acquiring emergent competitors, and control of digital infrastructures. The described characteristics cause the emergence of serious discussion about the adequacy of existing competition policies for digital markets regulation (Franck and Peitz, 2022). Governments and competition authorities of many countries responded to those challenges with developing new regulatory frameworks for the regulation of digital platforms. Thus, in the European Union, there is the Digital Markets Act regulating designated gatekeeper platforms, and in the USA, the UK, China, and other countries there were enhanced antitrust investigation and competition policies in the field of digital markets (Fletcher, 2022). Thus, there is a recognition of the need for adapting the conventional competition frameworks to meet economic peculiarities of platform ecosystems.

Many investigations on digital platforms have been conducted within several academic disciplines, such as industrial organization, information systems, competition economics, and antitrust law. The majority of researches analyze industries individually or certain regulatory issues, while comparatively few of them conduct an integrated review of the economic characteristics of platform markets and the empirical evidence about market power in different digital industries. Therefore, there is a need to integrate the knowledge about platforms and market power to reveal the mechanisms of dominance and emerging regulations and discuss their impact on markets.

This review is devoted to the comprehensive assessment of platform economies and market power in them. In particular, the review will examine the following aspects: 1) the economic characteristics of platform markets, 2) the mechanisms of emergence and preservation of market power in digital markets, 3) approaches to the measurement of market power in platform industries, 4) the empirical evidence about market power in different digital markets, 5) international competition policies and regulatory responses, and 6) research gaps and further directions of researches.

In order to synthesize the literature clearly and systematically, the current paper will rely on academic articles, working papers, institutional reports, and policy and regulatory documents found using important databases and repositories, such as Google Scholar, Scopus, Web of Science, Science Direct, and SSRN. The literature search was performed using combinations of key terms, which include “platform economy”, “digital platforms”, “digital markets”, “market power”, “platform competition”, “network effects”, “data advantage”, “artificial intelligence”, “switching costs”, “platform ecosystems”, “digital antitrust”, and “platform regulation”. Academic or institutional sources were selected based on their relevance

to the objectives of the literature review, credibility, and contribution to the literature about the economic characteristics of digital platforms. Theoretical works in the field of platform economy were used in order to understand its economic foundation, whereas empirical sources were included in case they provided evidence about market concentration, competition, consumer behavior, and performance of digital platforms. Reports on competition policies and legal documents were used to discuss existing responses to competition problems and legal regulations. For the purpose of synthesis, the reviewed literature can be divided into theoretical, empirical, policy, and legal/regulatory sources.

2. Platform Economies: Conceptual and Economic Foundations

The evolution of digital technologies has redefined the structure of economic activities, leading to the emergence of platform economies, which are becoming increasingly prevalent in global markets. While traditional firms create value through production and distribution of goods/services, digital platforms enable interactions between several groups of users and thus allow exchanges of goods, services, information, and digital content. Digital platforms have become key intermediaries of contemporary economies as they decrease transaction costs, increase market efficiency, and use digital technologies, including cloud computing, artificial intelligence (AI), big data analytics, and mobile connectivity (Parker, Van Alstyne, and Choudary, 2016; Kenney and Zysman, 2016; Evans and Schmalensee, 2016). Consequently, platforms have transformed the nature of competition, innovation, and value creation in various industries. An important characteristic of the platform economy is its ability to coordinate interactions between heterogeneous users instead of producing the traded goods/services. Thus, Google, Amazon, Apple, Meta, Alibaba, Uber, and Airbnb gain substantial profits by ensuring efficient market interaction and fostering complementary innovations in their ecosystems. The importance of these firms has led to the recognition of digital platforms as the key organizational form of the digital economy (Gawer, 2022).

2.1. Platform Economy

The concept of platform economy stems from the theory of multi-sided markets when a platform serves various user groups and there is a dependency of the demands between the users. Rochet and Tirole (Rochet and Tirole, 2003) elaborated the framework showing that digital platforms incorporate indirect network externalities between different market participants. Thus, a marketplace platform connects sellers and buyers, a ride-sharing platform connects passengers and drivers, while a search engine connects users with advertisers. Unlike the traditional firms, the platform does not usually own the traded goods/services and provides only the digital infrastructure to ensure efficient interactions between the parties. Parker et al. (Parker, Van Alstyne, and Choudary, 2016) describe a platform as the

business model that creates value through exchanges between independent producers and consumers. The platform provides technological infrastructure, defines governance rules and decreases search, coordination, and transaction costs. Similarly, Evans and Schmalensee (Evans and Schmalensee, 2016) claim that digital platforms work as “matchmakers”, coordinating interactions between different parties and creating value by means of participation in the network rather than direct production.

One of the implications of this business model is the transition from pipeline competition to ecosystem competition. While traditional firms compete through production efficiency and differentiation of the produced goods/services, the platform competes by attracting a greater number of users, fostering complementary innovation, and creating a network of interconnected ecosystems of the products and services (Cusumano, Gawer, and Yoffie, 2019). Thus, the platform competition relies not only on increasing production capabilities, but also on the coordination of several market participants.

2.2. Types of Digital Platforms

Digital platforms have developed into different organizational forms with various economic functions. Despite the existence of great overlap between the categories, the most typical digital platforms may be classified into six major groups.

Search platform: The search platform collects and provides digital information using advanced search algorithms. The most famous representatives are Google and Microsoft’s Bing that earn revenues mainly due to digital advertising based on the user data.

E-commerce: The e-commerce platform allows for trading between buyers and sellers providing them with the digital market, payment system, logistics infrastructure, and reputation mechanism. Amazon, Alibaba, eBay, and Flipkart are the typical examples of this category.

Social media: The social media platform provides the possibility to create, distribute, and consume digital content and maintain online social networks. The platforms like Facebook, Instagram, TikTok, LinkedIn, and X rely greatly on user-generated content and targeted advertising.

Application platform: The application platform connects the software developer and the consumer through the centralized digital marketplace. Thus, the examples of such platforms are Apple’s App Store and Google Play that provide application distribution, payment processing, software verification, and ecosystem governance.

Sharing economy: The sharing economy platform coordinates decentralized service provision by matching the independent provider with the consumer. Thus, Uber, Lyft, Airbnb, DoorDash, Ola, and Upwork are the examples of how digital platforms provide transportation, accommodations, food delivery, and freelancing services based on algorithmic matching.

Digital payment: The digital payment platform allows for secure electronic fi-

financial transactions between consumers, merchants, and financial institutions. Thus, PayPal, Apple Pay, Google Pay, Alipay, PhonePe, and Paytm are the examples of how platforms provide the electronic payment solutions. Moreover, many digital payment platforms have evolved to include the broader financial ecosystems incorporating lending, investment, and insurance services (Kenney and Zysman, 2016; de Reuver, Sørensen, and Basole, 2018).

Nowadays, the large technology companies operate several types of platforms simultaneously. Amazon operates an ecosystem integrating e-commerce, cloud computing, digital advertising, logistics, streaming services, and artificial intelligence, while Google incorporates search, Android, YouTube, cloud computing, advertising, and AI services. The architecture of the digital platform ecosystem is depicted in Figure 1 below. This explains the way in which the digital platform owner provides the infrastructure that makes interaction possible between the consumers, firms, developers, advertisers, and other service providers. The interactions provide data, which are analyzed through the application of artificial intelligence to improve the platform services, and hence create a reinforcing feedback loop for the platform.

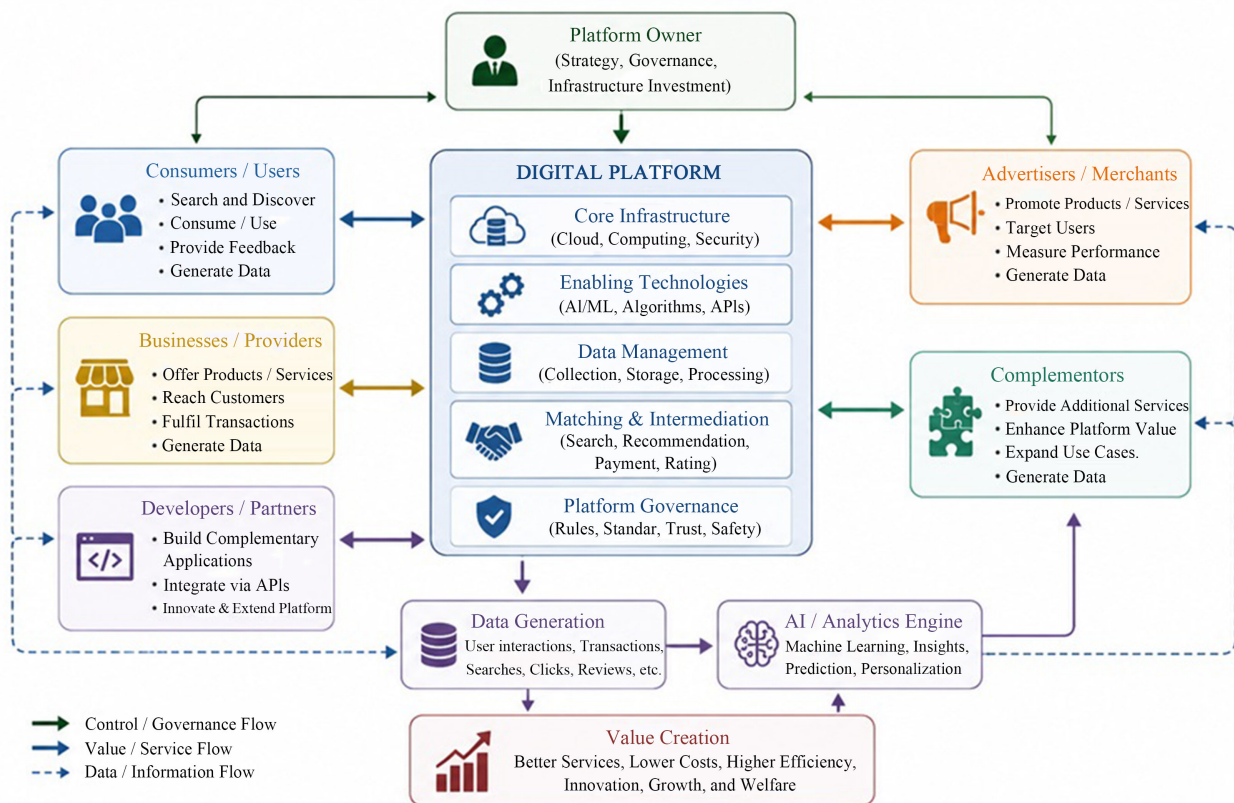


Figure 1. Conceptual architecture of a digital platform ecosystem showing interactions among platform participants, data generation, AI-enabled analytics, and continuous value creation (Parker, Van Alstyne, and Choudary, 2016; Evans and Schmalensee, 2016; Gawer, 2022).

It is necessary to differentiate among various types of organizational forms of

digital platforms due to the fact that their approaches to generating value and exercising market power can be quite different. Transactional platforms, such as e-commerce platforms and sharing economy marketplaces, are mostly used for enabling transactions between buyers and sellers or consumers and service providers, so that their value creation process relies on indirect network effects, efficiency of matching and volume of transactions. App ecosystems, like Apple's App Store or Google Play, serve as intermediaries between users and developers, controlling such processes as application distribution, payments processing and some technical requirements of applications. Their operation and market power rely on governance of ecosystems, switching costs and interoperability. Digital infrastructures provide such digital infrastructures as cloud computing to other companies and organizations, thus being influenced by economies of scale and technological dependence. The vertically integrated platform business model, which includes the combination of activities related to search, advertising, operating system, cloud computing, hardware, payments, or any other complementary activity within an established company, can leverage competitive advantages in multiple interdependent markets through economies of scope, data aggregation, product bundling, and ecosystem integration. Thus, the conclusions reached in this review do not suggest that market power in platform business models is created through the same factors for all platforms.

2.3. Economic Foundations of Platform Economies

There are several economic principles that drive the development of digital platforms and distinguish platform markets from other traditional industries.

1) Network Effects

Network effects represent the primary principle of platform economies. Katz and Shapiro showed that the value of a good or service rises with an increasing number of people using it (Katz and Shapiro, 1985). In case of digital platforms, there may be both direct network effects where users benefit from interacting with bigger communities, and indirect ones where a higher level of activity on one platform side encourages people on the other side to join it. For example, a greater number of customers attracts new suppliers on the Amazon platform, but a higher number of suppliers leads to greater product variety and more buyers attracted (Rochet and Tirole, 2003). Such reinforcing loops usually result in "winner-takes-most" market structures accompanied by strong concentration.

2) Economies of Scale

There are high economies of scale in digital platforms because of large investment in the development of the software, infrastructure, cybersecurity, and AI, but the marginal cost of providing services for extra users remains relatively low. When the number of users grows, the average cost drops quickly, and allows successful platforms to scale globally with minimal additional costs (Parker, Van Alstyne, and Choudary, 2016). Such cost structure largely helps the emergence of dominant global platforms.

3) Economies of Scope

In addition to economies of scale, digital platforms benefit from economies of scope, since infrastructure, algorithms, cloud resources, customer relationships, and datasets can be used in several related markets. This makes it possible to combine in unified ecosystems such different services as search engines, cloud computing, digital advertising, AI, digital payments, and e-commerce, and thus to increase competitive advantage and customer loyalty (Cusumano, Gawer, and Yoffie, 2019).

4) Data as an Economic Resource

The data became some of the most valuable assets of the platform economies. Every interaction with a digital platform—searches, purchases, clicks, reviews, and location data—adds up to the proprietary database of the platform owner. Such data improve machine learning algorithms used in recommendation systems, advertising, demand forecasts, logistics, fraud detection, and personalization (Varian, 2018). The resulting data-AI feedback loop makes it possible to constantly improve the quality of services provided and attract new users, thus collecting new data and growing the platform even further.

5) Reduction of Transaction Costs

The reduction of transaction costs through better information provision, search reduction, easier contracts formation, electronic payments, and creation of reputation systems is another distinctive feature of digital platforms. It corresponds to the theory of the firm by Coase (Coase, 1937), according to which firms exist because they reduce transaction costs more efficiently than markets. According to transaction-cost economics by Williamson, the use of digital technologies improves coordination and reduces uncertainties and asymmetries of information (Williamson, 2008). Therefore, platform economies often become more efficient than traditional market structures.

The combination of network effects, economies of scale, scope, data accumulation, and transaction cost reduction explains the fast development of platform-based business models in the global economy. At the same time, such economic characteristics create the structural conditions for market concentration and competitive advantages. In order to analyze the mechanisms by which digital platforms gain and maintain their market power, it is necessary to understand the economic foundations presented above.

3. Sources of Market Power in Digital Markets

The sources of market power in digital markets differ substantially from those of traditional firms. While conventional companies usually get competitive advantages due to the possession of physical assets, production efficiency, or economies of scale, digital platforms derive their market power from the interplay between network effects, data accumulation, artificial intelligence, switching costs, ecosystem integration, and digital infrastructure control. These mechanisms mutually reinforce each other, creating positive feedback loops and giving successful

platforms the opportunity to build up sustainable market positions while increasing the barriers to entry for potential competitors (Parker, Van Alstyne, and Choudary, 2016; West, 2019; Cusumano, Gawer, and Yoffie, 2019).

Unlike traditional monopolies based on pricing power, dominant digital platforms usually offer most of their core services for free. Thus, in the digital context, market power appears to be multidimensional and much harder to estimate. Recent literature suggests that platform monopoly should be regarded as the result of several economic mechanisms working together rather than just a competitive advantage source (Cr  mer, De Montjoye, and Schweitzer, 2019).

3.1. Network Effects

The most essential source of market power in platform-based economies is network effects. They happen when value generated by a platform rises as more users become part of the network. The concept of network externalities was first described by Katz and Shapiro (Katz and Shapiro, 1985), who showed that the rising number of users makes the product or service more attractive for potential users as well. Later, Rochet and Tirole (Rochet and Tirole, 2003) demonstrated how the concept of network externalities can be extended to two-sided markets, where platforms create value for multiple groups of users at once by internalizing the indirect network effects. Network effects can be divided into two large categories. Direct network effects appear when users get more utility from interacting with a large group of users. Thus, social networks such as Facebook, LinkedIn, and WhatsApp become more useful when more people use them, as communication possibilities rise.

Indirect network effects, on the other hand, happen when the growing number of users on one side of the platform increases value for the users on another side. For example, the growing number of sellers on Amazon adds more variety of products, attracting more buyers, which, in its turn, creates incentives for more sellers to join the platform. The same feedback loop works for app stores, online marketplaces, and digital payment platforms (Rochet and Tirole, 2003). Strong network effects often result in self-reinforced growth, creating very concentrated markets characterized by “winner-takes-most” dynamics. After reaching the critical mass, competing platforms often fail to attract enough users, making incumbent’s position even stronger.

3.2. Data Advantage and Artificial Intelligence

Data has become one of the most valuable strategic assets in the digital environment. Every user action including searching for information online, buying goods or services, writing reviews, using social networks, providing geo-coordinates, etc. creates data, which can be analyzed and used to improve the operation of the platform (Varian, 2018). Moreover, the competitive importance of data is augmented by artificial intelligence. The more data algorithms have, the better they perform. More accurate prediction means that more users will use a platform. In its turn,

the growing number of users generates even more data, allowing platforms to improve their algorithms and performance further. Thus, data and AI create feedback loop resulting in cumulative competitive advantages that are almost impossible for the new entrants to replicate (Brynjolfsson and McAfee, 2014). Since access to the large-scale proprietary data cannot be simply bought or created by other platforms, established platforms gain substantial informational advantages over the new ones. Therefore, data accumulation has become one of the main sources of persistent market power in the digital economy (Cr  mer, De Montjoye, and Schweitzer, 2019).

However, network effects, data gathering, and artificial intelligence do not have to lead to market dominance. Their effects in competition may be diluted by multi-homing, which is the practice where users become part of more than one platform, as well as interoperability and portability of data, which makes switching less burdensome. Differentiation between the competing platforms may enable them to draw particular users, while innovation from new players may change the existing competitive advantages. In that sense, while network effects, data, and artificial intelligence may strengthen the dominant position of incumbent platforms, their role in creating market power depends on other aspects of competition, including switching costs and innovations.

3.3. Switching Costs and Consumer Lock-In

Another important source of market power is switching costs, which make consumers less willing to move to a competing platform. Unlike traditional switching costs, which are mostly monetary, digital switching costs include the loss of accumulated digital assets, personalized recommendations, purchase history, cloud storage, social network, applications compatibility, and platform-specific knowledge (Tiwana, 2013). Consumer lock-in becomes especially relevant in the context of the integrated digital ecosystems. For example, users of the Apple ecosystem use such devices as iPhone, iCloud, Apple Pay, Apple Music, Apple Watch, and App Store. The replacement of any part of the ecosystem would mean the need to replace multiple other components and, thus, make switching costs higher (Treasury, 2019).

The same situation happens with businesses that operate on Amazon Marketplace and Google Ads. Businesses usually spend a lot of time optimizing their work in the platform and using specific methods of promotion and attracting customers, which makes moving to the competing platform economically unprofitable. Such lock-in mechanisms decrease competitive pressure while giving incumbents the possibility to keep their customers for a long period of time.

3.4. Economies of Scale and Scope

Digital platforms exhibit exceptionally strong economies of scale, as the development of the software, cloud infrastructure, cybersecurity, and artificial intelligence requires large initial investments, while marginal cost of serving additional users

is low. Growing in size, platforms' average operating cost is falling rapidly, which allows companies to expand globally and stay profitable at the same time (Parker, Van Alstyne, and Choudary, 2016). Along with economies of scale, digital platforms get economies of scope, which consist of the use of technological infrastructure, algorithms, cloud resources, and customer relationships built in one business area in the context of multiple complementary products (Cusumano, Gawer, and Yoffie, 2019). Such strategy reduces the cost of operations and strengthens customer retention at the same time.

3.5. Platform Ecosystems and Vertical Integration

Ecosystem approach has become increasingly popular in modern digital platforms. The ecosystem strategy involves the integration of complementary products, such as operating system, app store, cloud infrastructure, digital payments, advertising networks, and artificial intelligence, into a unified technological environment (Treasury, 2019). There are several competitive advantages associated with vertical integration. Companies get the preferential access to consumer data, coordinate user identity across all services, bundle complementary products, optimize advertising systems, and increase their market power in the adjacent industries. Moreover, such integration allows companies to practice self-preferencing, when they give preferential treatment to their own products in the context of search ranking or digital marketplace (Cr  mer, De Montjoye, and Schweitzer, 2019).

The competition authorities have raised concerns about the growing ecosystem expansion, claiming that it might substantially decrease market contestability by making consumers more dependent on the particular platform and decreasing the competitive opportunities for the independent players.

3.6. Barriers to Entry

The interplay between network effects, data accumulation, switching costs, ecosystem integration, and economies of scale result in strong barriers to entry in digital markets. Unlike traditional industries, where barriers are often based on capital investment and access to the natural resources, barriers in digital markets are informational and technological. Although new firms often have innovative technologies, they cannot compete effectively due to the existence of the extensive user network, proprietary databases, developed developer community, and global technological infrastructure of the incumbent firms. Also, dominant companies often buy promising startups before they can become serious competitors (Cunningham, Ederer, and Ma, 2021). Therefore, the competition in the digital markets occurs more and more "for the market" rather than "within the market".

Figure 2 identifies the key factors that contribute to the market power attained by digital platforms. The network effect leads to increasing numbers of users, which then results in increased data gathering, better artificial intelligence, increased service performance, user lock-in, expansion of the ecosystem, and high barriers to entry. This creates a reinforcing feedback loop, which helps the plat-

form attain and maintain its dominance in the digital market sector (Cr  mer, De Montjoye, and Schweitzer, 2019; Treasury, 2019).

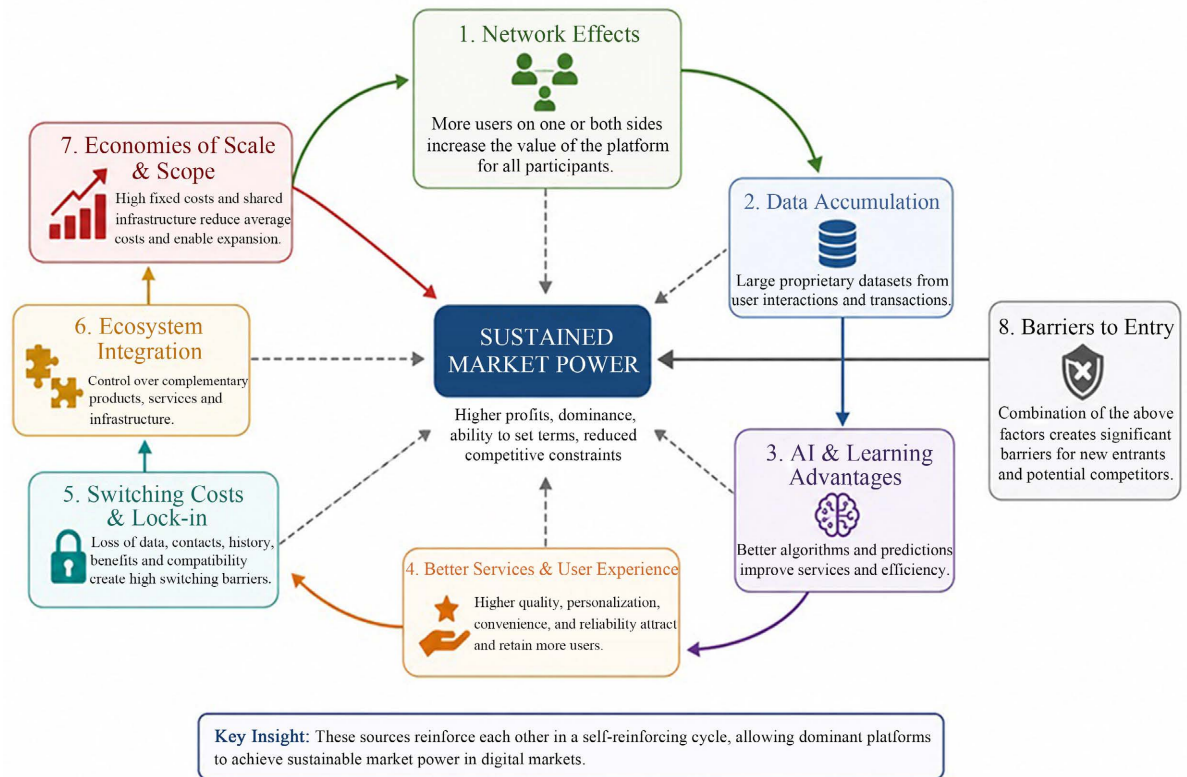


Figure 2. Conceptual framework illustrating the major sources of market power in digital markets and their reinforcing interactions (Cr  mer, De Montjoye, and Schweitzer, 2019; Treasury, 2019).

Table 1. Sources of market power in digital markets.

Source of market power	Economic mechanism	Competitive implication	References
Network effects	Larger user base increases platform value	Winner-takes-most markets	(Rochet and Tirole, 2003; Katz and Shapiro, 1985)
Data accumulation	Continuous collection of user information	Improved algorithms and competitive advantage	(Varian, 2018; Cr��mer, De Montjoye, and Schweitzer, 2019)
Artificial intelligence	Learning from proprietary datasets	Higher service quality and innovation	(Varian, 2018; Brynjolfsson and McAfee, 2014)
Switching costs	Loss of data, contacts, and digital assets	Reduced consumer mobility	(Tiwana, 2013)
Economies of scale	High fixed cost and low marginal cost	Cost advantage for incumbents	(Parker, Van Alstyne, and Choudary, 2016)
Economies of scope	Shared infrastructure across services	Cross-market expansion	(Cusumano, Gawer, and Yoffie, 2019)
Platform ecosystems	Integration of complementary services	Greater user dependence	(Cusumano, Gawer, and Yoffie, 2019; Treasury, 2019)
Vertical integration	Control of multiple layers of the value chain	Extension of market power	(Cr��mer, De Montjoye, and Schweitzer, 2019; Treasury, 2019)
Acquisition of competitors	Elimination of potential rivals	Reduced market contestability	(Cunningham, Ederer, and Ma, 2021)

Table 1 describes the key factors that contribute to market power in digital platforms. Digital platforms do not work independently; rather, the key forces complement each other to create cumulative competitive advantages that give structure to digital markets that is different from industrial markets. The argument put forward in this section reveals that market power in digital platforms depends on the interaction of technological, economic, and organizational variables rather than any one of them. It is critical to understand these forces for developing appropriate measures to gauge competition in digital markets. This is why the next section covers conventional as well as new measures of market power in the digital economy.

4. Assessing Market Power in Digital Markets

Market power assessment has always been one of the key goals of the field of industrial organization and competition economics. Traditionally, market power refers to the possibility of a firm increasing prices and reducing output while still remaining profitable as the consequence (Bain, 1956). Traditional market power metrics including market share, concentration, Herfindahl-Hirschman Index (HHI), Lerner index were applied for assessing the degree of competitiveness in different industries (Lerner, 1934; Hirschman, 1980). The appearance of digital platforms changed the situation dramatically—many platform services are provided for free, competition is now based on data and innovation rather than prices, and firms compete in several interconnected markets at the same time. Therefore, there is a need for broader approaches to measuring market power which take into account the specifics of digital platforms (Cr  mer, De Montjoye, and Schweitzer, 2019; West, 2019).

Unlike traditional industries with rather clear borders, the digital platform ecosystem is a dynamic environment consisting of such segments as search engines, social media, e-commerce, digital advertising, cloud computing, app stores, artificial intelligence and digital payments. This means that the interconnectedness of markets results in cross-platform externalities and makes the traditional method of market definition even more difficult. Thus, recent literature argues that the market power should be assessed using a multidimensional framework that incorporates both traditional structural measures and new parameters.

4.1. Traditional Indicators of Market Power

In the past, competition regulators relied upon a series of indicators to estimate market concentration and the dominant position of companies. Market share of a company continues to be the most straightforward and commonly used indicator of market power. Companies with consistently high market shares exercise more control over the market processes and competitive environment. But the indicator becomes ambiguous in digital markets because many companies provide services free of charge, and thus it is impossible to make a valid comparison based on revenues (Bain, 1956).

Herfindhal-Hirschman index (HHI) represents another commonly used indicator of market concentration. It is defined as a sum of squares of market shares of all companies in the market,

$$HHI = \sum_{i=1}^N s_i^2,$$

where s_i denotes the percentage market share of firm i . Higher HHI values indicate greater market concentration and potential competitive concerns (Hirschman, 1980). Competition authorities such as the U.S. Department of Justice (DOJ) and the Federal Trade Commission (FTC) routinely employ HHI thresholds during merger assessments.

Another classical indicator is the **Lerner Index**, which measures a firm's pricing power by comparing price with marginal cost,

$$L = \frac{P - MC}{P},$$

where P represents price and MC denotes marginal cost. Values approaching one indicate stronger monopoly power, whereas values close to zero suggest competitive markets (Lerner, 1934). However, because many digital platforms offer free services to users, marginal-cost pricing provides limited information regarding actual competitive strength.

4.2. Measurement Challenges in Assessing Digital Market Power

There are several features in the digital platform markets that reduce the validity of traditional competition measures. First, many of the services provided by platforms, such as search engines, social media platforms, mapping tools and communications applications are available for free. Platforms profit from users' attention via advertisement, data analysis, subscriptions or complementary products. Therefore, price-based indicators significantly understate competitive power (West, 2019). Second, many digital platforms work in multi-sided markets where interplay between different sets of users creates indirect network effects. For example, Google search platform acts for the benefit of its users, advertisers, publishers and application developers at the same time. The market power in such cases cannot be assessed exclusively on the basis of pricing, it also requires coordination of interactions between multiple sets of participants (Rochet and Tirole, 2003). Third, digital markets are characterized by high dynamics, companies constantly innovate with the help of artificial intelligence, updates of software, cloud computing and development of ecosystems. The market power of a platform may have considerable future prospects despite its relatively small current market share due to the technology lead or innovation. Fourth, digital ecosystems make traditional boundaries of markets more blurred. Companies like Amazon, Google, Microsoft, Apple and Meta compete and collaborate across many industries simultaneously. It is increasingly hard to identify the relevant market by the means of antitrust practices (Cr  mer, De Montjoye, and Schweitzer, 2019).

4.3. Indicators of Market Power Specific to Digital Markets

Recognizing the limitations of the traditional methods, researchers have developed a set of market power indicators specific to digital platform markets.

1) User Base and User Engagement

The size and engagement level of a platform's user base provide valuable information about its competitive status. Indicators like monthly active users (MAU), daily active users (DAU), average time spent per session, user retention and engagement rate tend to give better information about market power than traditional metrics based on revenues (Evans and Schmalensee, 2016). A large, highly-engaged user base helps strengthen the network effects and makes the platform more attractive for advertisers and complementors.

2) Control of Data

Control over data has become the key indicator of digital market power. Platforms with rich datasets can utilize the data more efficiently than their competitors when developing recommendation systems, targeting ads, detecting fraud, optimizing logistics and building machine learning models (Varian, 2018). Since large datasets are not replicable, data control confers significant competitive advantage and erects entry barriers.

3) Artificial Intelligence Capability

The role of artificial intelligence has been growing in evaluating the competitiveness of a firm in digital markets. Better AI models mean higher quality of personalization, recommendations, prediction, automation of decision making and increased efficiency. Since algorithm's performance usually gets better with access to larger datasets, AI capability is the embodiment of the accumulated competitive advantages of leading platforms (Varian, 2018).

4) Switching Costs

High switching costs reduce consumer mobility and increase market power. Indicators include limited interoperability, non-portability of digital assets, compatibility with complementary products, high migration cost and ecosystem dependency. High switching costs allow incumbents to maintain consumers despite existence of alternatives (Tiwana, 2013).

5) Ecosystem Control

Contemporary digital companies compete not with single products but with ecosystems. Therefore, the degree of vertical integration within operating systems, cloud services, digital payments, app stores, hardware and advertising networks gives important information about competitive position of firms (Cusumano, Gawer, and Yoffie, 2019). Companies with large ecosystems use their advantages in one market to gain advantages in adjacent markets.

6) Innovation Capability

Since digital competition becomes more technology-dependent, innovation capability is another key indicator of market power. R&D spend, patent portfolio, software development costs, acquisition of innovative startups and investments in AI all build up long-term competitive advantages (Teece, 2018). It is necessary to

make a distinction between market concentration, competitive advantage, and market power because although these terms are related to each other, they are not identical. Market concentration involves the structure or market shares of the companies in question while competitive advantage means firm-specific strengths or resources which might help a company gain an advantage over its competitors. Market power implies that a firm is capable of acting largely independently of competitive constraints. It follows that having many users, lots of proprietary data, good AI technology or high investments into R&D might suggest competitive advantages of a platform and even market power but this does not mean that these characteristics ensure that market power exists.

Figure 3 depicts a multidimensional approach that enables the assessment of market power in digital markets through the combination of traditional competition metrics and digital metrics. This framework proves that structural concentration metrics need to be supported by user engagement metrics, data ownership metrics, AI capability metrics, switching costs metrics, ecosystem metrics, and innovation metrics to create a holistic view of platform dominance (West, 2019; Crémer, De Montjoye, and Schweitzer, 2019).

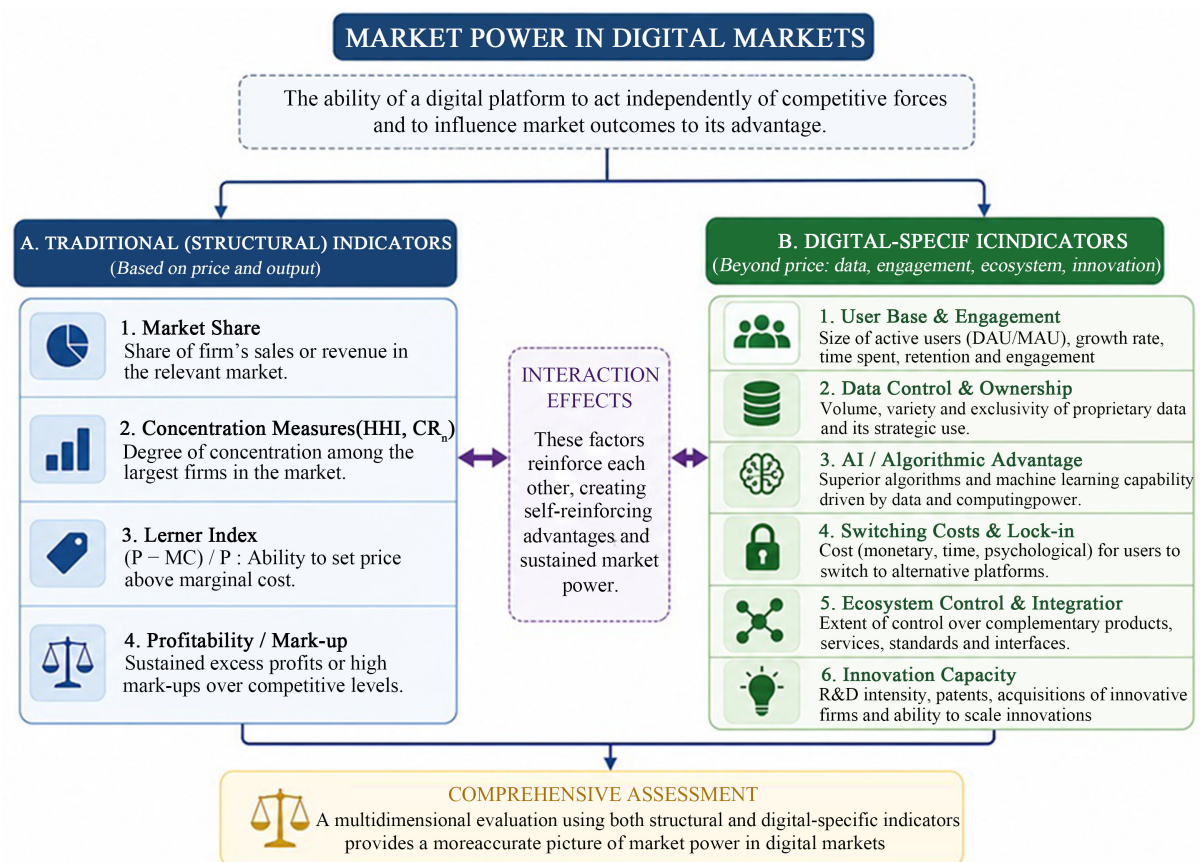


Figure 3. Integrated framework for measuring market power in digital markets using traditional and digital-specific indicators (Crémer, De Montjoye, and Schweitzer, 2019; West, 2019).

In sum, the measurement of market power in digital markets demands an ex-

pansion from the traditional price-oriented approach into a more general model which takes into account the relevance of data, artificial intelligence, engagement, integration, and innovation. While traditional measures of concentration can still be useful in pinpointing structural dominance, they offer a limited view of competition in digital markets. A more holistic analysis would thus call for a combination of the two types of measures. The multidimensional analysis mentioned above forms the basis of the discussion on market power in digital markets, which is presented in the next section. The analysis of market power in digital platforms markets needs both traditional concentration indices as well as specific digital indicators. Although the use of traditional indices like market share, HHI, Lerner index, concentration ratio and others provides valuable information about the structure of the market and its pricing power, it may not sufficiently reflect the specifics of the platform economy. Specific digital indices like user engagement, data possession, AI abilities, switching costs, integration into the platform's ecosystem and innovation ability can provide valuable information about the position of digital platforms in the market. These indices are presented in **Table 2** below.

Table 2. Comparison of traditional and digital-specific indicators used to assess market power in platform economies.

Indicator	Category	What it Measures	Advantages	Limitations	References
Market Share	Traditional	Firm's share of the relevant market	Simple indicator of market dominance	Difficult to define relevant markets in digital economies	(Bain, 1956)
Herfindahl-Hirschman Index (HHI)	Traditional	Degree of market concentration	Widely used in merger analysis	Does not capture data or network effects	(Hirschman, 1980)
Lerner Index	Traditional	Ability to price above marginal cost	Measures monopoly pricing power	Less useful for zero-price digital services	(Lerner, 1934)
Concentration Ratio (CR4/CR8)	Traditional	Combined market share of leading firms	Indicates industry concentration	Ignores platform ecosystem interactions	(Hirschman, 1980)
User Base (DAU/MAU)	Digital	Platform adoption and user engagement	Reflects network size and activity	May not directly indicate profitability	(Evans and Schmalensee, 2016)
Data Ownership	Digital	Control over proprietary user data	Indicates informational advantage	Difficult to quantify objectively	(Cr��mer, De Montjoye, and Schweitzer, 2019; West, 2019)
AI Capability	Digital	Strength of machine learning and algorithmic performance	Captures innovation and service quality	Rapid technological evolution complicates comparison	(Varian, 2018; Teece, 2018)
Switching Costs	Digital	Difficulty for users to change platforms	Indicates customer lock-in	Industry-specific and difficult to measure	(Tiwana, 2013)
Ecosystem Integration	Digital	Degree of integration across complementary services	Reflects cross-market competitive advantage	Complex multidimensional assessment	(Cusumano, Gawer, and Yoffie, 2019)
Innovation Capacity	Digital	R&D intensity, patents, acquisitions, and technological development	Indicates long-term competitive strength	Benefits may materialize over long time horizons	(Cusumano, Gawer, and Yoffie, 2019; Teece, 2018)

5. Market Power in Leading Digital Industries

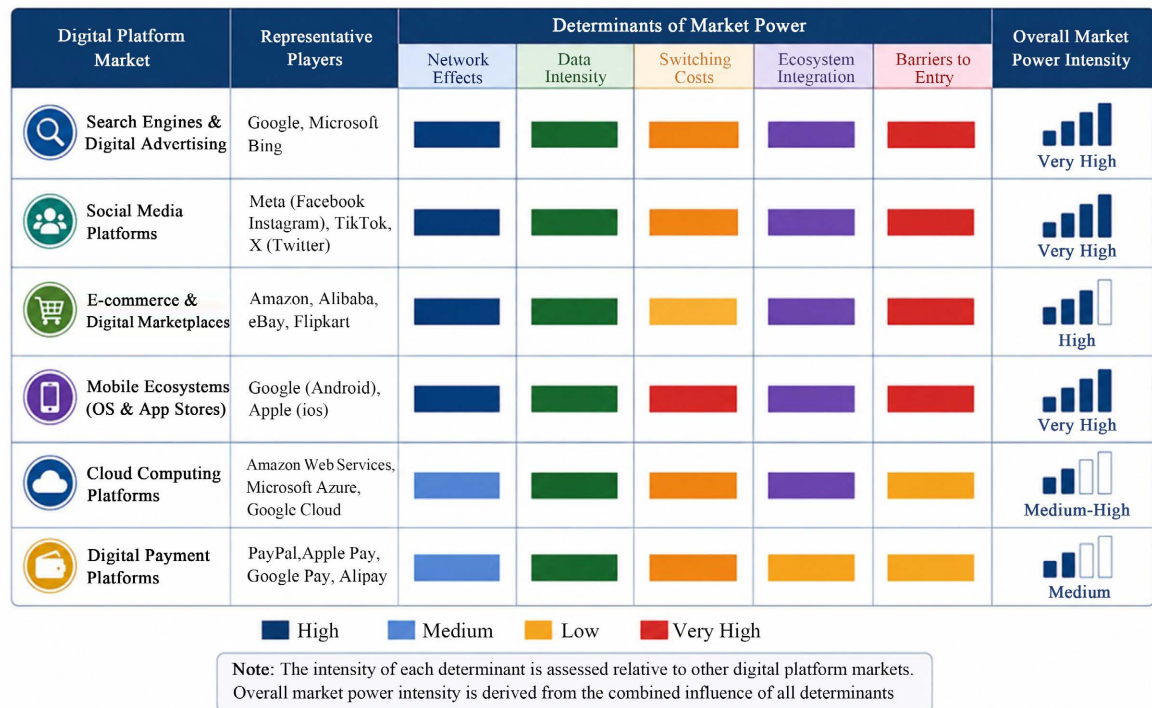
The above-mentioned mechanisms of market power are observed in the competitive nature of modern digital markets. Empirical research demonstrates that industries that operate under the concept of the platform economy display higher market concentration levels compared to many conventional sectors due to network effects, data generation, economies of scale, and ecosystems of the incumbent companies (Crémer, De Montjoye, and Schweitzer, 2019; Evans and Schmalensee, 2016; West, 2019). Despite some differences in the level of concentration within particular industries, there is some evidence that only a few companies are in leading positions in search engines, social networks, digital advertising, e-commerce, mobile operating systems, and applications marketplaces. Such dominance raises the concerns related to innovation, consumer surplus, and market contestability.

One of the most concentrated segments of the digital market is search engines. The dominant position of Google has been explained by network effects, good quality of search algorithms, large amounts of data collection, and investments in artificial intelligence technologies (Varian, 2018). As more users become active on the platform, more data is available for improving search algorithms and targeting advertisements. The market of digital advertising has many similarities with the market of search engines. Indirect network effects are very high as advertisers prefer those platforms that have large communities and targeting features. Combination of search services, digital advertising infrastructure, and artificial intelligence leads to high entry barriers for rival companies (West, 2019). Competition agencies of different countries have launched investigations into Google's advertising ecosystem for possible anticompetitive behaviour (Competition and Authority, 2020).

The evidence mentioned in this part comes from various types of literature and must thus be understood through the methodological contributions that come from each. Theoretical work forms the economic basis for the understanding of network effects, platform competition, and market concentration, while empirical work supplies observable data on platform conduct, concentration, usage levels, or competitive processes. Policy and institutional work evaluates the conditions of competition, as well as regulatory problems, while legal and regulatory work reports on enforcement cases and the evolution of the competition framework. As a consequence, theoretical and policy work are not used as direct empirical evidence, and industry evidence must be understood in relation to the kind of evidence each mentioned source provides.

The social media industry is also characterized by high levels of concentration due to direct network effects. Platforms like Meta (Facebook and Instagram), TikTok, and X get their value from large user communities, where a higher level of user involvement makes the process of communication and content creation easier (Nieborg and Poell, 2018). Empirical studies confirm that the switching costs are especially relevant for social media as switching can lead to the loss of existing

social networks, personal identity, and all previously created content (Tiwana, 2013). All this, along with the use of complex recommendation systems and advertisement tools, helps to increase user retention and entry barriers. **Figure 4** shows the level of market power in various digital platform industries in terms of the degree of network effects, data-intensity, switching costs, ecosystem interlinkage, and entry barriers. Search engines, social networks, and mobile ecosystems show the most concentration while digital marketplaces show relatively less concentration due to seller involvement.



Legend: Data Intensity = degree to which platform activity and competitive performance depend on data collection and use; Ecosystem Integration = degree of integration across complementary platform services.

Figure 4. Comparative assessment of market power across major digital platform industries based on network effects, data intensity, switching costs, ecosystem interlinkage and entry barriers. The legend identifies Data Intensity and Ecosystem Integration using their respective colors. The comparative assessment represents the combined influence of these dimensions rather than any single factor.

The emergence of digital marketplaces and e-commerce platforms has changed the retail market landscape with the integration of online marketplaces, payment systems, logistics, cloud computing, and digital advertising in one ecosystem. Such companies as Amazon and Alibaba succeeded by using economies of scale, advanced analytics, and effective supply chain management (Gawer, 2022). Indirect network effects also play an important role in the operations of marketplace operators. The more sellers there are on the platform, the greater the variety of products will be, which, in turn, attracts more buyers. As a result, the higher is the demand, the more sellers join the platform (Evans and Schmalensee, 2016). Nevertheless, the competition regulators have expressed their concerns regarding self-

preferencing, exclusive arrangements, and the promotion of proprietary products in digital marketplaces (Competition and Authority, 2020).

Mobile operating systems and mobile applications marketplaces are also good examples of market power of platforms. In general, mobile operating systems from Apple (iOS) and Google (Android) dominate in the worldwide smartphone operating system market creating highly concentrated mobile ecosystems (Gawer, 2022). The control over app distribution, payment systems, software standards, and development allows platform owners to affect the market beyond the mobile operating system. The researchers claim that the integration of mobile ecosystems increases switching costs and competitive advantages for consumers and developers (de Reuver, Sørensen, and Basole, 2018). Table 3 summarizes selected studies and policy analyses examining market power in digital platform markets, distinguishing theoretical contributions, empirical evidence, and policy or regulatory assessments.

Table 3. Selected studies and policy analyses examining market power in digital platform markets.

Study	Market/Context	Type of Evidence	Methodology/Approach	Methodology/Approach	References
Katz & Shapiro (1985)	Network industries	Theoretical	Economic theory	Demonstrated how network externalities can influence competition and contribute to market concentration.	(Katz and Shapiro, 1985)
Crémer et al. (2019)	Digital platforms	Policy analysis	Competition-policy analysis	Highlighted how data, network effects, and ecosystem characteristics can strengthen the competitive position of dominant digital platforms.	(Crémer, De Montjoye, and Schweitzer, 2019)
West (2019)	Online platforms	Comparative policy review	Comparative review of digital-platform competition	Identified network effects, data advantages, and related structural factors as important sources of entry barriers and competitive concerns.	(West, 2019)
Treasury (2019)	UK digital markets	Competition-policy review	Competition and policy assessment	Recommended stronger competition-policy interventions to address the market power of large digital platforms and gatekeeper effects.	(Treasury, 2019)
Cunningham et al. (2021)	Digital innovation and acquisitions	Empirical	Empirical analysis of acquisitions	Provided evidence that acquisitions of potential competitors may reduce future competition, particularly when acquired firms represent emerging competitive threats.	(Cunningham, Ederer, and Ma, 2021)

6. Competition Policy and Regulation of Competition

The growing concentration of digital markets has raised questions about the relevance of conventional antitrust law in this context. Traditionally, antitrust policy was concerned mostly with price effects and market shares; however, the platforms usually offer their services for free and achieve dominance relying on data, network effects, artificial intelligence, and ecosystem. Therefore, new approaches were developed taking into account the peculiarities of platform markets such as gatekeeper status, self-preferencing, access to data, and interoperability (Crémer,

De Montjoye, and Schweitzer, 2019; West, 2019).

In contrast to traditional sectors, competition in digital markets includes not only monopoly pricing, but also exclusionary practices, acquisitions of potential competitors, restriction on data portability, and self-preferencing. This has led to the adoption of special regulation instruments for digital platforms in a number of countries.

6.1. European Union

The European Union has become a world leader in regulating digital platforms using the Digital Markets Act (DMA) and the Digital Services Act (DSA). In the first act, gatekeeper platforms are obliged to give access to business users, provide data portability, avoid self-preferencing, and increase interoperability of competing services (European Parliament and Council of the European Union, 2022). The goal of the DMA is not destruction of large platforms but preservation of contestable digital markets by preventing activities that are unfair towards competitors. Together with DSA, the EU regulations strive to achieve transparency, consumer protection, and fair competition.

6.2. United States

The policy framework in the United States continues to depend largely on Sherman Act, Clayton Act, and Federal Trade Commission Act. However, in recent years, there have been more investigations of large tech companies by the agencies involved in competition policy, including the investigations of Google, Meta, Amazon, Apple, and Microsoft.

Guidelines issued in recent years on mergers have emphasized the role of digital ecosystems, innovation competition, and potential competition more than current market shares. The emphasis is due to the realization that innovative start-up companies' acquisitions and digital infrastructure can lead to reduced competition in the market irrespective of the lack of immediate impact on prices (Turolla, Ohira, and Lima, 2010).

6.3. Other International Initiatives

Several other countries have made their competition policies stronger for digital markets as well. In the United Kingdom, the Competition and Markets Authority formed Digital Markets Unit (DMU) to regulate companies that have Strategic Market Status (SMS). Additionally, China has formulated stricter laws for monopoly in the case of large internet platforms, while India has analyzed the app store market, digital payments market, online marketplaces, and search service under the Competition Act. Despite the differences in the policy frameworks, these initiatives have similar goals—improving market contestability, avoiding abuse of dominant position, transparency, and fair competition in the digital ecosystem (West, 2019). **Figure 5** illustrates the main regulatory strategies taken by the leading nations for regulating digital platform markets. The figure shows the

importance that is accorded to gatekeeper regulation, fair competition, transparency, interoperability, and consumer protection. There have been developments in the regulations for digital platforms in major economies due to emerging issues associated with market dominance, gatekeepers, data, and potentially anticompetitive behavior. Various regulatory frameworks have been implemented by different economies with similar intentions to foster fair competition and market contestability. **Table 4** presents an overview of the main regulatory frameworks in the EU, USA, UK, China, and India along with the respective objectives and references.

Figure 5. Global Regulatory Framework for Digital Platform Competition

	European Union	United States	United Kingdom	China	India
	 Digital Markets Act (DMA) Digital Services Act (DSA)	 Antitrust Laws Sherman Act, Clayton Act, FTC Act Merger Guidelines	 Digital Markets Unit (DMU) Strategic Market Status (SMS) Framework	 Anti-Monopoly Law (AML) Guidelines for Platform Economy	 Competition Act Digital Market Investigations
 Regulatory Focus	- Gatekeeper regulation - Fair digital markets - Transparency & interoperability	- Antitrust enforcement - Merger control - Prevention of exclusionary practices	- Regulation of firms with Strategic Market Status - Pro-competitive interventions	- Prevention of monopoly abuse - Fair competition in platform economy	- Prevent abuse of dominance - Ensure fair competition in digital markets
 Key Approach	- Ex-ante obligations for gatekeepers - Pro-competition rules - Data portability & interoperability	- Case-by-case enforcement - Merger review based on innovation competition - Monitoring digital ecosystems	- Ex-ante regulation for SMS firms - Conduct requirements - Market investigation powers	- Ex-post enforcement - Data & algorithm scrutiny - Platform conduct regulation	- Ex-post enforcement - Market studies - Investigation of digital platform practices
 Major Measures	- DMA gatekeeper rules (no self-preferencing, data sharing, etc.) - DSA transparency & accountability	- Merger guidelines - Antitrust litigation - Investigations of major tech firms	- Designation of SMS firms - Pro-competitive interventions - Codes of conduct	- Anti-monopoly investigations - Fines & remedies - Guidelines for platform economy	- Abuse of dominance cases - Market study reports - Corrective directions
 Primary Objective	Ensure contestable and fair digital markets; protect businesses and consumers	Promote competition, protect innovation, and prevent anti-competitive conduct	Promote competition and innovation in digital markets for the benefit of consumers	Prevent monopoly, ensure fair competition, and support healthy platform development	Ensure fair competition and prevent abuse of dominance in digital markets
Common Goals Across Jurisdictions  Promote Fair Competition  Ensure Transparency and Accountability  Enable Data Portability and Interoperability  Protect Consumers and Businesses  Encourage Innovation and Choice					

Note: The framework summarizes the principal regulatory approaches adopted by major jurisdictions to address competition concerns in digital platform markets.
Sources: European Commission (2022); U.S. DOJ & FTC (2023); CMA (2023); SAMR (2021); Competition Commission of India (2023); OECD (2019).

Figure 5. Major regulatory approaches for digital platform competition (West, 2019; European Parliament and Council of the European Union, 2022; Turolla, Ohira, and Lima, 2010).

Table 4. Comparison of competition policies for digital platforms.

Jurisdiction	Major Regulation	Primary Objective	References
European Union	Digital Markets Act (DMA), Digital Services Act (DSA)	Gatekeeper regulation and fair competition	(European Parliament and Council of the European Union, 2022)
United States	Sherman Act, Clayton Act, FTC Act, Merger Guidelines	Antitrust enforcement and merger control	(Turolla, Ohira, and Lima, 2010)
United Kingdom	Digital Markets Unit (DMU)	Regulation of Strategic Market Status firms	(Dnes and de Fossard, 2023)
China	Anti-Monopoly Law	Platform regulation and market fairness	(Jin, 2022)
India	Competition Act	Prevention of abuse of dominance in digital markets	(India, 2019)

In any case, competition policy seems to be developing into a new approach where more factors than price are being taken into account, such as data, networks effects, platform ecosystems, and digital gatekeepers. Despite different approaches to regulation in different countries, it seems evident that the concept of contestable digital markets can be maintained only through proactive control over the platforms involved.

7. Research Gaps and Future Directions

In spite of the fast growth of research on digital platforms and market power, there are still some open questions. Even though the current research considerably contributed to the development of our knowledge on network effects, data competition, and platform ecosystems, further evolution of artificial intelligence, digital ecosystems, and platform governance creates the need for further research (Cr  mer, De Montjoye, and Schweitzer, 2019; West, 2019). First, one of the important aspects that requires additional research is the problem of measuring market power in digital markets. Traditional measures like market shares and concentration ratios are still essential but they usually do not reflect the competitive impact of the data ownership, AI usage, user engagement, and ecosystem integration. Creating multidimensional standardized metrics that incorporate structural, technological, and behavioral measures is an important direction for future research (Cr  mer, De Montjoye, and Schweitzer, 2019). Another area that requires attention is the role of artificial intelligence (AI) in the formation of digital competition. AI influences ranking algorithms, recommendation system, advertisement distribution, pricing policy, and content moderation. With the use of generative AI in search engines, e-commerce websites, and productivity applications, it is worth investigating how AI can increase market power or give rise to the new entrant (West, 2019).

Additionally, future research should also focus on the issues of platform interoperability and data portability. Regulatory solutions such as the EU Digital Markets Act seek to lower switching costs and increase market contestability through mandatory interoperability. At the moment, however, there is little evidence about the effectiveness of such measures (European Parliament and Council of the European Union, 2022).

The last gap in the field is competition in developing economies. In spite of the fact that there are many empirical studies on North American, European, and Chinese digital markets, the number of works focused on emerging digital platforms in other countries like India, Brazil, or Southeast Asian countries is quite small. Comparative studies that analyze differences in regulations, consumer behavior, digital infrastructure, and platforms' adoption among different developing economies are highly desirable.

Finally, future research should pay attention to the problems related to the broad conception of consumer welfare. Traditionally, antitrust policies were interested only in the effect of price, whereas platforms compete based on service

quality, innovations, privacy, personalization, and consumer experience. Analysis of these aspects of competition can give us the fuller picture of the impacts of market power of platforms (Cr  mer, De Montjoye, and Schweitzer, 2019).

8. Conclusion

The fast proliferation of digital platforms has radically changed the structure of modern economies by replacing competition between products with competition within digital ecosystems. In contrast to conventional companies, platform businesses acquire competitive advantage by means of network effects, data collection, artificial intelligence, economies of scale, and ecosystem integration. This makes it possible for relatively few firms to gain dominant positions in a number of digital markets while generating significant value through innovation, efficiency, and reducing transaction costs (Parker, Van Alstyne, and Choudary, 2016; Cusumano, Gawer, and Yoffie, 2019). This review has shown that market power in digital markets is generated as a result of the combined action of several factors rather than one mechanism. Network effects bring more users and help gather data which improves artificial intelligence and platform services. Improved service quality increases engagement and switching costs, expands digital ecosystems, and creates higher entry barriers. Market power in digital markets is not limited to monopoly pricing and now also involves data dominance, control over digital infrastructure, innovation, and ecosystem governance (Cr  mer, De Montjoye, and Schweitzer, 2019).

The review has also revealed that traditional competition metrics are inadequate to assess competition in digital platform markets. Such measures as market share, concentration ratios, the Herfindahl-Hirschman Index, and the Lerner Index still can be used to identify structural concentration, but are not enough to capture platform characteristics such as user engagement, data, algorithm capabilities, interoperability, and innovation. A multidimensional framework that combines traditional and platform-specific metrics is needed to evaluate competition in digital markets (West, 2019). Empirical research conducted in the fields of search engines, social networks, e-commerce, mobile ecosystems, and digital advertising confirms the theoretical expectation of concentration in digital platform markets. At the same time, digital platforms have created significant economic and social value through innovation, more choice for consumers, higher accessibility and productivity. For policymakers, it is crucial to encourage technological development without closing off digital markets (Cr  mer, De Montjoye, and Schweitzer, 2019; West, 2019).

This recognition is reflected in competition regulations tailored to digital platform markets. Examples include EU's Digital Markets Act, merger review policies developed in the USA, and similar legislation in the UK, China, and India. Such a transition shows that there is a general understanding of the need for platform-specific competition policy which allows maintaining fair competition and incentives for innovation at the same time (European Parliament and Council of the

European Union, 2022; Turolla, Ohira, and Lima, 2010; Jin, 2022).

Overall, the platform economy will be a driving force behind the development of global economics in the next decades. With the growing use of artificial intelligence, cloud computing, digital ecosystems, and data-driven services in economic processes, it is crucial to understand the mechanisms behind the digital market power. Future research should concentrate on the development of methods for measuring platform dominance, analyzing the competitive aspects of artificial intelligence, and evaluating the effectiveness of regulatory policy.

Author Contributions

Shrihan Jha: Conceptualization, literature review, data collection, analysis, and preparation of the original manuscript. Sananjay Biswas: Supervision, methodology, validation, critical review, editing, and overall guidance. Both authors reviewed and approved the final version of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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