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A Primer on Competition in the Digital Economy

Authors: Sarah Stanley, Srikara Prasad, and Anubhuti Singh with inputs from Beni Chugh

1. Introduction

Disruptive innovations (mainly through digitalisation) are resulting in a change in the structure of markets and their functioning, emergence of new business models as well as new products and processes (Organisation for Economic Co-operation and Development, 2017). These innovations have been delivering significant benefits to consumers but have also given rise to a spate of public policy concerns ranging from safety and privacy to competition. Especially with respect to competition, these innovations have surfaced challenges such as an increase in the level of concentration in certain markets, a contraction in the entry of new players, an escalation of mark-ups charged by firms well above their costs, and the risks associated with access to large amounts of personal data (Organisation for Economic Co-operation and Development, 2019).

The virtues of markets and competition have been long extolled by economists. Unfettered competition is believed to protect consumers from the political influence of lobbies and compel producers to deliver better products and services while keeping a check on prices. However, competition is rarely perfect; markets fail, and market power is not kept in check. This is perhaps more pronounced in the case of digital ecosystems where the use of data creates conditions for more concentrated entities. The use of data leads to economies of scale, network effects and economies of scope. This makes it easier for data-intensive businesses to assume a large size and also enter into new markets. Given the increasing prominence of the digital economy in every aspect of human life, competition authorities across jurisdictions have begun assessing the adequacy of competition law and policy in addressing the challenges raised by data-intensive businesses (United Nations Conference on Trade and Development, 2019). There is a growing consensus that competition policy which was crafted for firms that typically offer goods at non-zero positive prices, and often are dominant in just one market, will need to be adapted for digital ecosystems.

This primer attempts to unpack the unique characteristics of digital markets, the implications that they have for business models of entities, and the attendant challenges of applying existing competition policy frameworks to these markets. In this context, we also examine some of the recent regulatory and legislative initiatives taken by competition authorities globally.

2. Characteristics that distinguish digital markets from traditional markets

The digital economy departs strongly from traditional market mechanics because of one distinguishing input — data and its processing (Organisation for Economic Co-operation and Development, 2014, pp. 89-90). As new technological advancements take place, the collection, storage, processing, distribution, and analysis of data has become much easier (Rusche, 2019; Shapiro & Varian, 2008). As a result, data has come to play a central role in the functioning of digital markets (Parker, Petropoulos, & Van Alstyne, 2020).

The rampant use of data is transforming the structure of both individual market participants and the markets themselves.

Data distinguishes itself from other traditional inputs of production because (i) it is non-rivalrous and enables economies of scope, and (ii) induces network effects and economies of scale (Jones & Tonetti, 2020).

The interplay of these characteristics creates an environment where market participants (predominantly platforms) compete “for” the market rather than “within” the market. Data’s non-rivalrous nature, network effects, economies of scale and scope all work together to sharply reinforce the first mover advantage leading to tipping, increased incentives to innovate and invest in new markets, and vertical and/or horizontal expansion (Parker, Petropoulos, & Van Alstyne, 2020). We discuss the effect of these characteristics of data on business models and markets in the digital ecosystem next.

i. Data is non-rivalrous and enables economies of scope.

A key economic characteristic of data is that it is *non-rivalrous* i.e., data can be used infinitely and simultaneously by different entities without diminishing its availability (Buchanan, 1965). This is in contrast to traditional inputs which are limited and diminish in quantity with use.

The non-rival characteristic of data creates two major opportunities for entities. First, many entities can simultaneously use the same dataset for the same purpose. For example, different financial sector entities can process a consumer’s personal data to provide financial products or services. Second, the same entity can use the same dataset for different purposes (subject to consent from the data principal/subject) (Omaar, 2021). A financial sector entity can process consumers’ personal data to simultaneously provide services, improve back-end processes, generate market insights, and comply with regulations. As a result, entities can make large gains by using data broadly (Jones & Tonetti, 2020).

Due to data’s non-rivalrous nature, entities can also use the same dataset to create different products or enter into new markets altogether creating *economies of scope*. Economies of scope refers to the production of two or more products together rather than separately, resulting in a lower average total cost. This can occur if the products share similar inputs, have production processes that are interrelated, or if the products are complements (DePamphilis, 2011).

As entities enter new markets and offer a variety of services, it enables them to gather and process more data, and infer more insights to refine existing products, enhance efficiency and also enter still newer markets (Schepp & Wambach, 2016). As techniques of machine learning yield further insights from larger datasets, digital businesses become capable of expanding into adjacent markets with either novel or higher quality (or both) products and services when compared to their competitors (Zingales, et al., 2019; Baye & Prince, 2020). This provides them with a significant competitive advantage over entities without this capacity.

However, the non-rivalrous nature of data does not imply that all entities have equal access to the data, or the value derived from it. Entities will have to create channels through which they can collect data and invest in technology that can derive value from it. But the costs involved in creating these channels and investing in the required technology can be prohibitive. Entities which can afford these costs naturally gain a competitive advantage in the market (Bundeskartellamt, 2016).

Cross-leveraging competitive advantage across different markets

The data collected and analysed by entities in one market can generate a competitive advantage across several markets for the same entity and help to create synergies (Organisation for Economic Cooperation and Development, 2020). In principle, the non-rivalrous characteristic of data allows it to be used several times without depletion and by any number of entities concurrently (Carrière-Swallow and Haksar, 2020; Haksar et al. 2021; World Bank 2021). The data collected is utilised by firms to either design new products and services or even train new machine learning algorithms which in turn helps to attract more users and more data (Crémer, de Montjoye, & Schweitzer, 2019). The accumulation of additional data volumes thereby is an underlying component that helps entities change their business models and expand into new markets or business areas thus achieving economies of scope. As argued by the Financial Stability Board, *“Once a large multiservice platform offers one service, they become more efficient at offering others”* (Crémer, de Montjoye, & Schweitzer, 2019). For instance, Google’s activities originated with a focus on search engines, but has now expanded into associated business areas such as household technology, hardware, operating systems and more recently telecommunications infrastructure and autonomous mobility systems (Monopolkommission, 2015).

This incentivises entities in digital markets to engage in **vertical integration**, where *“Two or more successive stages of production and/or distribution of a product are combined under the same control”* (Khan, 2017). It leads to better internalisation of network externalities thus helping to improve efficiency. For example, Amazon has expanded along the value chain by sourcing and creating its own suite of products (Amazon Basics) and services (Amazon Prime, Amazon Web Services) and by also growing its distribution (warehouses, shipping, and delivery) (Recke, 2021). This tends to happen due to the discriminatory access that these entities have to strategic information or data. For instance, marketplace operators, like Amazon, have access to information both about the behaviour of consumers purchasing products/services as well as information on what sellers are selling on the marketplace. This information can be used by Amazon, when it acts as a seller on its own platform, to identify the products/services that are in demand and also efficiently modify their range as well as prices. The platform could also restrict the sellers (operating on the platform) from getting certain

ii. Data induces network effects and economies of scale.

Digital businesses demonstrate network effects which simply refers to the increase in the user’s benefit from using a platform with an increase in the number of other users on the platform (Parker, Petropoulos, & Van Alstyne, 2020; Parsheera, Shah, & Bose, 2017). Network effects can be both direct and indirect. **Direct network effects** can be prominently observed in the case of online social networking platforms, such as Facebook or Twitter, wherein the value of the given platform to each existing user increases as additional users join and use the platform (Baye & Prince, 2020).

Multi-sided markets¹ particularly exhibit **indirect network effects**, where a positive effect is derived by users on each side of the market due to an expansion in users on any one side (Parsheera, Shah, & Bose, 2017; Zingales & Lancieri, 2019). For instance, in the case of e-commerce platforms, third-party sellers may be attracted to a given e-commerce platform if they find that several paying consumers are already available on the platform. In the case of the Android ecosystem, the platform becomes more attractive for app developers and advertisers when more users use Android. As more app developers join the platform, users get access to a greater variety and quality of products and services,

¹ Multi-sidedness is a defining characteristic of online platforms. Multi-sidedness is exhibited as platforms help connect two or more separate but well-defined groups of users, where benefit for each side is based on who participates on the other side/s (Anderson et al., 2020).

making it even more attractive for additional users to join the platform (Parker, Petropoulos, & Van Alstyne, 2020).

Digitisation of the supply value chain is critical to the activation of both direct and indirect network effects (Katz & Shapiro, 1985; Parker, Van Alstyne, & Jiang, 2016), which in turn results in the creation and appropriation of value (Amit & Zott, 2001). Entities with high levels of digitisation have the ability to conduct experience-based learning through machine learning techniques, which helps them collect and analyse large volumes of data. This is used to identify patterns in behaviour to improve the accuracy of offerings provided to users. An increase in the accuracy of the predictions, increases the value of offerings to users and helps attract additional users. This series of causal events i.e., the positive feedback loop is being referred to as the **data network effects** (Gregory et al., 2020; Haftor, Climent & Lundström, 2021).

These entities with high levels of digitisation also experience **economies of scale** i.e., the costs associated with processing data (or datum) decreases with each additional unit of data (Fortuny, et al., 2013; Lewis & Rao, 2014; Varian, Farrell, & Shapiro, 2004). It is based on the understanding that entities face a higher initial fixed cost associated with investments in research and development of machine learning algorithms or in the creation of enabling infrastructure such as data storage servers etc., but relatively lower marginal costs. (Parsheera, Shah, & Bose, 2017). Consequently, once digital firms have been established, they can quickly grow their operations to cater to additional users at minimal cost (Parker, Petropoulos, & Van Alstyne, 2020).

Therefore, in the case of digital platforms we see network effects and economies of scale supplement each other to help provide competitive advantage. Network effects imply that each additional user generates greater benefit or value for all users and economies of scale imply that the average cost of serving users is falling. Therefore, benefits to consumers increase even as costs fall. Technically speaking, for a given level of fixed cost, there are no economic constraints on the expansion of digital entities.

Tippling and concentration of market power

Network effects and economies of scale are key contributors to market power in the digital context (Plaitakis, 2019). The combination of network effects and economies of scale has two consequences: (i) The market tends to be inclined to favour one firm due to the efficiency resulting from concentration. Larger the number of people in the same network, larger the marginal value created by adding an additional user. (Jullien & Sand-Zantman, 2019); (ii) The size and influence exerted by big data entities makes it challenging for smaller players or new entrants to successfully exercise competition pressure (Plaitakis, 2019; Schepp & Wambach, 2016). This results in the phenomenon known as '**tippling**' and a winner-takes-all outcome in digital markets.

These characteristics of data and its implications on business models raise fresh challenges for competition policy. Digital-native firms seem to enjoy the benefits of network effects, economies of scale and economies of scope. They serve several markets simultaneously and in many of those markets, they provide services at zero prices. These aspects raise questions for competition policy which is attuned to dealing with well-defined markets and non-zero positive prices. We discuss these in detail in the following section.

3. Challenges posed by digital markets for competition law

Competition regulators face multiple challenges in identifying anti-competitive and abusive practices in digital markets. The most prominent among them are challenges in (i) defining a relevant market,

(ii) establishing dominance of entities, (iii) identifying anti-competitive and abusive conduct, (iv) addressing conglomerate effects due to access to data, and (v) assessing competitive concerns arising from mergers and acquisitions.

3.1. Challenges in defining a relevant market

Identifying the relevant market is central to assessing anti-competitive conduct. Identifying the relevant market helps competition regulators understand the context within which they must assess anti-competitive conduct. Assessing the market in the wrong context could risk regulators making erroneous assessments that can have larger implications for competition in the market (Organisation for Economic Co-operation and Development, 2017). A relevant market is determined by ascertaining the relevant product market and the relevant geographical market in which an entity operates. The relevant product market is the market in which the products and services are interchangeable or substitutable. The relevant geographical market is the market in which the conditions for competition are more or less similar (Kaushik, 2019).² Identifying the relevant market can be challenging in the case of digital markets as (i) the tests used for identifying relevant markets can be inadequate, and (ii) complications surface due to the multi-sidedness of digital platforms (European Parliament, 2015).

i. The tests used for identifying relevant markets can be inadequate.

Traditional competition inquiries to identify relevant markets rely on the Small but Significant Non-transitory Increase in Price (SSNIP) test (or the Hypothetical Monopolist Test) (United Nations Conference on Trade and Development, 2019). The test helps regulators understand the breadth of the market (Mandrescu, 2018). The SSNIP test relies on demand-side substitutability of a product to identify all the entities who are providing similar products in the market. The test assesses if a hypothetical monopolist would be willing to impose a small but significant increase in price (usually by five to ten percent) of their products or services. Broadly, products are deemed to be substitutable if the increase in price makes consumers shift from using the monopolists' products to other products.³ The regulator can define the market depending on all the products that can act as substitutes (Mandrescu, 2018). However, this test can have little effect in digital markets where products and services are offered at zero-price. Regulators have had to rely on other factors, like product functionalities, to identify the relevant market (United Nations Conference on Trade and Development, 2019).

The European Commission had faced the task of identifying the relevant market in a digital context in the *Facebook/WhatsApp*, *Microsoft/Skype* and the *Microsoft/Nokia* merger assessments. The Commission in these assessments segmented the larger digital market by relying on (a) the functionality of the services, (b) the platforms through which the services were offered, and (c) the operating systems that supported the services (Facebook/WhatsApp, 2014). For instance, in the *Facebook/WhatsApp* merger assessment, the Commission segmented WhatsApp and Facebook into two different markets. The Commission ascertained that WhatsApp operated in a “market including only consumer communications apps for smartphones” because WhatsApp provided personal messaging services over smartphones (Facebook/WhatsApp, 2014).

The Competition Commission of India (CCI) followed a similar approach in 2020 in *Harshita Chawla v. WhatsApp Inc. and Ors* (the WhatsApp Pay case). In this case, the CCI was tasked with identifying the

² See s.2(r), s.2(s) and s.2(t) of the Competition Act, 2002.

³ See Sharma, K., *SSNIP Test: A Useful Tool, Not a Panacea*, Competition Commission of India, 2011, https://www.cci.gov.in/sites/default/files/presentation_document/SSNIPTestKKSharma260711.pdf.

relevant market in which WhatsApp operates. It had to examine if WhatsApp operated in a broadly defined “*market for user attention*” where it competed with different kinds of digital service providers, or in a more narrowly defined “*market for internet-based messaging application through smartphones*” where it competed with similar messaging applications.

The CCI relied on two factors to differentiate WhatsApp from other digital service providers which compete for consumers’ attention. First, the CCI relied on functional substitutability of the products. WhatsApp is primarily used for personal messaging, but Facebook is used mainly for communicating with many users simultaneously. Second, the CCI relied on the different channels through which the services are usually used. WhatsApp is used primarily through smartphones, but Facebook is used on both smartphones and PCs. Based on these considerations, the CCI ascertained that WhatsApp operates in a narrow “*market for Over-the-Top (OTT) messaging apps through smartphones*” (Harshita Chawla v. WhatsApp Inc. and Ors, 2020).

Some new approaches emphasise tests that rely on non-price factors like costs incurred by consumers, and quality of products offered to consumers. For instance, the small but significant non-transitory increase in cost (SSNIC) test relies on the understanding that consumers in digital markets choose between competing products based on the information and attention costs involved in using products. Consumers could choose to switch from products that demand more information or greater attention to products that demand less. Cost therefore acts as a more useful lens to understand demand-side substitutability in the absence of price and helps in identifying the breadth of the relevant product market (Mandrescu, 2018). Similarly, the small but significant non-transitory decrease in quality (SSNDQ) test relies on assessing the impact of a decrease in the quality of services (on consumer’s demand), instead of an increase in price. The test, therefore, uses quality as a benchmark for understanding product substitutability and in determining the breadth of the relevant product market (Mandrescu, 2018).

ii. Identifying the relevant market is complicated by the multi-sidedness of digital platforms.

Transactions in traditional markets usually take place directly between a buyer and a seller. This changes in the digital economy where traditional markets are replaced by platforms and multi-sided markets (Dvara Research, 2020). Digital platforms (such as Facebook, Amazon, Ola or Swiggy) serve as two-sided or multi-sided markets (United Nations Conference on Trade and Development, 2019).⁴ This complicates relevant market assessments in at least three ways (European Parliament, 2015; Mandrescu, 2018; United Nations Conference on Trade and Development, 2019; Wismer & Rasek, 2017; Yang, 2018; Zingales & Lancieri, 2019):

- a. The multi-sidedness of digital markets can make it challenging to pinpoint the locus of competition and therefore define the relevant market for enforcement of competition law.
- b. The presence of different kinds of consumers on different sides of the market can make demand-side substitutability difficult to assess.
- c. Consumers on different sides of the market can experience indirect network effects, with each side of the market depending on the other. For instance, people looking to hail cabs on a ride sharing platform would rely on the availability of cab drivers, and vice versa. Thus, a ride hailing company is simultaneously catering to two markets—the passengers looking for cabs and drivers looking to ferry passengers. Further, there are interdependencies

⁴ For instance, Ola and Uber provide two-sided markets with consumers on one side and cab drivers on another. Facebook is a multi-sided market providing OTT services to consumers on one side, and advertisers, merchants, developers etc. on other sides.

between both markets where changes in one market affect changes in the other. In the ride hailing business for instance, it has been argued that strong indirect network effects can lead to tipping of markets (Smichowski, 2018). Similarly, changes in prices can affect both sides of markets (Ahmadinejad et al., 2019). Traditional tools in competition policy such as the SSNIP were designed to assess the implications of price change within a single market and are ill-suited to study implications of price change in multi-sided markets. Matters complicate even further, when one side of the market is charges a zero monetary price (Wismer & Rasek, 2017).

Regulators wrestle with the thorny challenge of defining one common relevant market for all sides or defining many interlinked relevant markets for each side (Organisation for Economic Cooperation and Development, 2020). In China, the Antitrust Guidelines of the Antimonopoly Committee of the State Council on the Economic Field of Platforms, 2021 (Chinese Antitrust Guidelines) advises regulators to define one common relevant market or multiple interconnected relevant markets when examining multi-sided markets (Article 4(1)). The Article also advises regulators to define a relevant market based on non-price factors including platform function, business model, user groups, multilateral nature of markets, network effects, lock-in effects, transfer costs etc (State Administration for Market Regulation, 2021).

3.2. Challenges in establishing dominance of entities

Entities which enjoy a dominant position in the market can act independently without being limited by competitive forces like competitors' operations and consumer choice (European Parliament, 2015; Hoffmann-La Roche & Co. v. Commission of the European Communities, 1979). While dominance is not problematic in itself, regulators are conscious of instances where entities abuse their dominance to entrench themselves in the market. To assess abuse, regulators must first assess if an entity enjoys a dominant position in the relevant market. Dominance assessments can be complicated in digital markets where traditional tools of assessment have limited utility (United Nations Conference on Trade and Development, 2021).

Traditional approaches to assessing dominance rely on factors like demand-side substitutability (assessed through the SSNIP test), profitability, market power⁵ or market share, and entry barriers (OECD, 2020)⁶. From these, measures relying on price (SSNIP tests, profitability, and market power) can produce inaccurate assessments because many entities in digital markets charge zero prices, as discussed previously. Entities in digital markets may also be barely profitable in their operations (Organisation for Economic Cooperation and Development, 2020). Although market shares can help in assessing dominance, it is well established that market shares alone do not indicate dominance, especially in digital markets where market shares can vary constantly and consumers may avail of multiple providers simultaneously (Organisation for Economic Cooperation and Development, 2020).

⁵ Market power is defined as the “the ability of firms to unilaterally raise prices above, or quality below, the competitive level” and to maintain these conditions. See OECD, *Abuse of Dominance in Digital Markets*, 2020, <https://www.oecd.org/daf/competition/abuse-of-dominance-in-digital-markets-2020.pdf>.

⁶ The Competition Commission of India traditionally uses factors including (a) market share (b) the size and resources of the entity (c) size and importance of competitors (d) economic power of the entities (e) vertical integration in the market (f) dependence of consumers on the enterprise (g) entry and exit barriers and countervailing buying power (h) market structure and size of the market (i) source of dominant position and (j) social costs and obligations of the dominant entity to economic development. See Competition Commission of India, *Provisions relating to Abuse of Dominance*, https://www.cci.gov.in/sites/default/files/advocacy_booklet_document/AOD.pdf.

Further, entities in a digital market can leverage economies of scope to enter new markets or develop new business models. These entities tend to cross-leverage their dominance in one market to quickly penetrate and become dominant in a new market. Regulators have found it difficult to gauge cross-market effects and pre-empt how quickly entities can become dominant (European Parliament, 2015). The CCI, for instance, has faced this challenge in two major cases:

- i. In *Bharti Airtel Ltd v Reliance Industries Ltd and Anr.* (the Jio case), one of the primary contentions was that Reliance Industries was using its dominance in the infrastructure and retail markets to penetrate the telecom market as Reliance Jio. The CCI relied on traditional tests for assessing dominance such as examining Jio’s market share and the competition Jio faced from other wireless telecom providers. The CCI concluded that Jio occupied a very small portion of the wireless telecom market and that it faced competition from at least three large telecom providers. The CCI accordingly declared that Reliance Jio was not a dominant entity (*Bharti Airtel Limited v. Reliance Industries Limited and Anr.*, 2017). However, Reliance Jio became a dominant entity in the market very quickly with a major market share and with fewer competitors (*Bharti Airtel Limited v. Reliance Industries Limited and Anr.*, 2017; Singh, 2020).
- ii. In the *WhatsApp Pay* case, the informants maintained that WhatsApp’s dominance in the smartphone OTT messaging market makes WhatsApp Pay a dominant entity in the UPI-enabled digital payments market. Similar to the Jio case, the CCI concluded that WhatsApp Pay is not dominant because it is a new entrant in the UPI market that would compete with other large entities like PayTM and Google Pay (*Harshita Chawla v. WhatsApp Inc. and Ors*, 2020). It remains to be seen if WhatsApp will turn out to be dominant in the UPI market.

As such, regulators have been making use of non-price measures to assess dominance in multiple investigations. These have included measures such as the functional substitutability of products, entry barriers into the market, entities’ access to personal data, and network effects. Some of the non-price factors used by competition authorities in different dominance assessments are presented in Table 1 (Crémer, de Montjoye, & Schweitzer, 2019; Organisation for Economic Cooperation and Development, 2016; United Nations Conference on Trade and Development, 2019). There is also emphasis on non-price tests, such as the SSNDQ and the SSNIC tests, that rely on non-price factors like costs incurred by consumers and product quality that can help identify dominant entities, as discussed previously.

Table 1: Non-price measures used to assess dominance

Cases	Measures used to assess dominance
<p><i>Google Search (Shopping)</i></p> <p>Forum: European Commission.</p>	<ul style="list-style-type: none"> • Barriers to entry created for new entrants by the need for large capital investments and strong network effects. • Infrequent multi-homing by users when using search engines. • Brand effects attached to Google products. • Lack of countervailing buyer power⁷ with consumers.

⁷ Market power can exist on either the supply side or the buyer side. Countervailing power refers to buyer market power (that is, the bargaining power of a buyer). For example, a single large buyer or group of buyers may possess sufficient market power to be able to depress the prices paid to sellers or easily switch between alternative suppliers. See Thomson Reuters Practical Law Glossary, Countervailing Power, <https://ca.practicallaw.thomsonreuters.com/3-595->

<p><i>Google Android</i></p> <p>Forum: European Commission.</p>	<ul style="list-style-type: none"> • Inadequate competitive constraints from iOS and the Apple App Store. • Barriers to entry and expansion for competitors. • Lack of countervailing buyer power with consumers.
<p><i>Facebook, Inc. (Exploitative business terms)</i></p> <p>Forum: Bundeskartellamt (Germany).</p>	<ul style="list-style-type: none"> • Network effects through the number of daily active users. • Difficulty for consumers in switching from Facebook to other platforms. • Facebook’s direct and indirect access to data sources that could strengthen network effects and raise entry barriers.
<p><i>Meru v Ola/Uber – Hyderabad, Mumbai, Kolkata, and Chennai</i></p> <p>Forum: Competition Commission of India.</p>	<ul style="list-style-type: none"> • Collusion between common investors of Ola and Uber.
<p><i>Meru Travels Solutions Ltd v Competition Commission of India</i></p> <p>Forum: Competition Appellate Tribunal.</p>	<ul style="list-style-type: none"> • The funding available for aggregators that can help them become dominant. • Communications from aggregators suggesting reliance on anti-competitive tactics to become dominant.
<p><i>Harshita Chawla v WhatsApp Inc and Ors</i></p> <p>Forum: Competition Commission of India.</p>	<ul style="list-style-type: none"> • WhatsApp’s popularity and wide usage as a messenger service, leading to strong network effects.
<p><i>Alibaba</i></p> <p>Forum: State Administration for Market Regulation (SAMR), China.</p>	<ul style="list-style-type: none"> • Income of Alibaba’s platform service and product trading value. • Alibaba’s ability to control service fees, network traffic on the platform and sales channels. • Consumers’ and merchants’ dependence on Alibaba, lock-in effects and switching costs. • Alibaba’s data holdings, algorithms, cloud services offerings and artificial intelligence technologies. • Alibaba’s logistic chains and payment services.
<p><i>Apple Music</i></p> <p>Forum: European Commission.</p>	<ul style="list-style-type: none"> • Vertical integration between Apple and Apple Music. • Gatekeeping by imposing entry conditions for competitors of Apple Music.

Sources: (Google Search (Shopping), 2017; Google Android, 2018; Facebook, Inc., 2019; Meru Travels Solutions Private Limited v. Competition Commission of India, 2016; Harshita Chawla v. WhatsApp Inc. and Ors, 2020; Raychaudhuri, 2020; Renard, Zhang, & Wang, 2021; United Nations Conference on Trade and Development, 2019; European Commission, 2021).

[5326?transitionType=Default&contextData=\(sc.Default\)&firstPage=true#:~:text=Countervailing%20power%20refers%20to%20buyer,easily%20switch%20between%20alternative%20suppliers.](https://www.researchgate.net/publication/35326?transitionType=Default&contextData=(sc.Default)&firstPage=true#:~:text=Countervailing%20power%20refers%20to%20buyer,easily%20switch%20between%20alternative%20suppliers.)

The Chinese Antitrust Guidelines in Article 11 prescribe a set of price and non-price factors that regulators can consider in determining the dominance of platforms. The non-price factors in the Article include and also build upon those listed in Table 1. These non-price factors include (State Administration for Market Regulation, 2021):

- i. The market share of the platform provider, which can be ascertained using transaction value, transaction volumes, sales, number of active users, user engagement and other indicators of market share.
- ii. Characteristics of competing platforms, including market share and innovation, and technological prowess.
- iii. The platform provider's ability to (a) influence competition in the upstream, downstream, and associated markets, (b) raise entry barriers, (c) generate network effects, (d) determine prices etc.
- iv. The financial and technical condition of the platform provider including (a) status of funding and investments in the platform, (b) size of the providers' assets, (c) financing capacity, (d) technological prowess, (e) intellectual property rights portfolio, (f) ability to access and process data etc.
- v. Importance of the platform to merchants and consumers who rely on the platform, which can be examined through lock-in effects and costs incurred in switching platforms.
- vi. Entry barriers arising from prohibitive capital investments, consumer conversion costs, challenges to data acquisition etc.

3.3. Challenges in identifying anti-competitive and abusive conduct

Current assessments of anti-competitive and abusive conduct rely on the consumer welfare standard. In this approach, regulators measure the benefits or harms to consumers to determine anti-competitive or abusive conduct. The conduct of an entity is considered to be abusive if it affects competition in a way that directly (from higher prices or lower quality) or indirectly (from reduced intensity of existing or potential competition, choice or innovation) affects consumers in an adverse manner (European Parliament, 2015; Organisation for Economic Co-operation and Development, 2018).

However, the distinguishing features of digital markets can make assessments of consumer harm difficult (United Nations Conference on Trade and Development, 2019; United Nations Conference on Trade and Development, 2021). The core challenge in establishing abuse appears to be in determining if the conduct of an entity is unfair or if it is normal business strategy (European Parliament, 2015; Organisation for Economic Cooperation and Development, 2020). For instance, in *Meru Travels Solutions Private Ltd v. Competition Commission of India*, the Competition Appellate Tribunal (COMPAT) was tasked with examining if Uber abused its dominance by offering deep discounts to consumers. The COMPAT could not conclude if Uber's ability to provide deep discounts was a result of efficiency gains or if Uber engaged in anti-competitive conduct by charging predatory prices to undercut competitors. The COMPAT called for a deeper market investigation that could better understand the nature of Uber's conduct (*Meru Travels Solutions Private Limited v. Competition Commission of India*, 2016).

Competition regulators have identified certain practices that can lead to harmful market outcomes like competition foreclosure, high entry barriers, diluted competition, and provision of poor-quality products. These practices seem to stem from the competitive advantages that entities derive from

processing data, including strong network effects, easier entry into new markets, rapid scaling of markets, and better understanding of consumer needs. Some of these practices include (OECD, 2020):

- i. **Predatory pricing**, where an entity charges prices below the cost of production to drive competitors out of the market, after which it recoups losses (OECD, 2020). The Chinese Antitrust Guidelines in Articles 12 and 13 follow a similar rationale in identifying predatory pricing practices. The test in these Articles look to examine if the prices charged are significantly lower than prices of the same, or similar, products without proper justification. Entities are allowed to charge low prices for a “*reasonable period of time*” if they can provide valid justification, i.e., for reasons such as platform development and consumer acquisition (State Administration for Market Regulation, 2021).

The CCI found predatory pricing practices in MCX Stock Exchange Ltd. v. National Stock Exchange of India Ltd. & Ors (The MCX case), Fast Track Call Cab Pvt Lt and Meru Travel Solutions Pvt Ltd v ANI Technologies Pvt Ltd, the Meru case and the Jio case. However, the authorities were unable to establish abuse of dominance because the entities involved did not have a dominant position in the relevant markets (Bharti Airtel Limited v. Reliance Industries Limited and Anr., 2017; Fast Track Call Cab Pvt Ltd v Meru Travel Solutions Pvt Ltd, 2015; MCX Stock Exchange Ltd v National Stock Exchange of India Ltd and Anr, 2011; Meru Travels Solutions Private Limited v. Competition Commission of India, 2016).

- ii. **Refusal to deal**, where an entity denies competitors access to essential inputs, technology, or distribution networks. For instance, in the *Microsoft* decision, Microsoft refused to provide essential information for interoperability between its own personal computers (PCs) and the PCs of its competitors. The European Commission ruled that Microsoft’s refusal created high entry barriers for competitors (Microsoft Case, 2004).

The Chinese Antitrust Guidelines also considers a refusal to deal on reasonable terms by “*necessary platforms*”, on which consumers rely heavily or which have no effective competitors, to be an abuse of dominance (State Administration for Market Regulation, 2021).

- iii. **Self-preferencing and self-dealing**, where an entity gives its own products or services greater preference over its competitors’ products or services (Australian Competition & Consumer Commission, 2019). Entities can do this in different ways, most commonly by:

- a. Providing more visibility to the entity’s own products over the competitors’ products. For instance, in the *Google (Shopping)* case, the European Commission fined Google for using algorithms that diverted consumer traffic from its competitors to its own products and services (Google Search (Shopping), 2017).

- b. Pre-installing applications onto devices. For instance, in the *Google Android* case, Google mandated pre-installation of Google Search and the Chrome browser on mobile phones having the Android operating system. The European Commission found this to be abusive conduct (Google Android, 2018).

- c. Gatekeeping, where entities define the rules for players on its platform. The core contention arises when a platform entity provides downstream services on its platform, creating a risk of conflicting interests. For instance, Apple has been accused of charging premiums from Spotify to participate on its App Store while exempting its own music application from the charges (Australian Competition & Consumer Commission, 2019; European Commission, 2021).

The Chinese Antitrust Guidelines captures this approach under Article 17 which prohibits the differential treatment of entities through different standards, rules, and decision-making algorithms (State Administration for Market Regulation, 2021). Under Article 8,

the Guidelines also call for examining abuse of dominance in cases where gatekeepers integrate vertically with downstream entities to compete in downstream markets (State Administration for Market Regulation, 2021).

- iv. **Bundling or tying**, where entities offer different products jointly, which consumers may or may not be able to opt out of. Tying or bundling of products could automatically raise barriers for competitors. For instance, in the *Microsoft* case, Microsoft had tied its media player to the Windows operating system. This raised barriers for other media players. The European Commission held Microsoft's conduct to be abusive (Microsoft Case, 2004). The CCI also explored bundling in the *Google Meet* and *WhatsApp Pay* cases. In the former, Google had bundled its video-conferencing service with its e-mail application. In the latter, WhatsApp had bundled its payment service with its messenger application. However, the CCI denied abuse in both cases on the ground that consumers had a choice in using bundled products. The Chinese Antitrust Guidelines, under Article 16, also seem to consider choice in using tied products as a critical parameter for assessing abuse of dominance (State Administration for Market Regulation, 2021).
- v. **Exclusivity agreements**, where entities impose exclusive obligations on merchants to not deal with other entities. Exclusivity agreements can foreclose markets for competitors. For instance, most recently, the Chinese competition regulator fined Alibaba for abusing its dominant position by prohibiting merchants on their platform from dealing with competing platforms (Renard, Zhang, & Wang, 2021). Exclusivity agreements are considered as abusive practices, under Article 15 of the Chinese Antitrust Guidelines, unless entities have valid reasons (like protecting consumer interests or intellectual property) to impose such restrictions (State Administration for Market Regulation, 2021).
- vi. **Exploitative abuse**, where entities exploit consumers through excessive pricing or through the misuse of personal data (European Parliament, 2015). The Chinese Antitrust Guidelines consider the forcible collection of "*non-essential user information*" as an unreasonable trading condition (Article 16) (State Administration for Market Regulation, 2021). In the European context, in 2019, the Bundeskartellamt fined Facebook for abusing its dominant position by collecting and aggregating consumers' personal data from its group companies like WhatsApp and Instagram. The Bundeskartellamt determined abuse on four grounds (Facebook, Inc., 2019):
 - a. Facebook's data policy was found to be detrimental to users and competitors.
 - b. It dictated the terms of the data policy unilaterally, abolishing the consumers' constitutional right to privacy.
 - c. The data policy was inconsistent with existing laws, including bloc-level and municipal laws.
 - d. The data policy gave Facebook a competitive edge as it had disproportionate gains from inappropriately processing personal data.

Similarly, in *In Re: Updated Terms of Service and Privacy Policy for WhatsApp Users*, the CCI preliminarily ruled that WhatsApp's privacy policy abused WhatsApp's dominance by diluting the quality of personal data protection for consumers (In Re: Updated Terms of Service and Privacy Policy for WhatsApp Users, 2021).

3.4. Difficulty in assessing the conglomerate effect due to access to data

A key set of questions also concern the extent to which **access to data provides a competitive advantage**, obstructing new entry and leading the incumbent entity to a position of dominance. As

digital markets are heavily data-driven, their network effects are unduly intensified as a result of the entities' capacity to exploit personal data as well as usage data. Entities can use data to continuously upgrade and provide products and services at lower prices or with greater personalisation (Khan, 2017). This could improve consumer welfare through better services or lower prices. On the flipside, these improvements could help entities raise high barriers for competitors (Digital Competition Expert Panel, 2019). For instance, Amazon serves as a critical intermediary between retail merchants and consumers. Serving as the intermediary gives Amazon access to key market information that can help it enter the retail market with enhanced efficiency and undermine incumbent retail merchants. These enhancements can also help to lock-in users and raise high barriers for newer entrants (Khan, 2017).

3.5. Challenges in assessing competition concerns arising from mergers and acquisitions

Merger analysis is an important ex-ante mechanism of tackling potential competition concerns that may stem from the market power of platforms. But in most jurisdictions a certain (monetary) turnover or asset threshold needs to be fulfilled for a merger to be subject to review. This process fails to consider the utility of data and its control by the merged parties (United Nations Conference on Trade and Development, 2019). Mergers can create pro-consumer effects by providing entities access to richer sets of data that can be used to provide better products or services to consumers. However, mergers can also be anti-competitive by concentrating access to important and difficult-to-replicate datasets in the hands of a few entities. When mergers and acquisitions give entities access to valuable aggregated datasets, they could intensify the dominant position of the acquiring entity or allow it to leverage market power, raising concerns about foreclosing entry into the market (Cr mer, de Montjoye, & Schweitzer, 2019).

In this context, an important issue that is being debated is the acquisition by dominant platforms of small but successful start-ups with a rapidly growing user base and considerable competitive potential (Argentesi et al., 2020). The concern arises when such acquisitions cement the dominance of a platform and can have a consequential effect on competition. This can transpire in several ways including elimination of a prospective competitor and raising of entry barriers for other potential competitors (Cr mer, de Montjoye, & Schweitzer, 2019). Such acquisitions tend to occur under the radar as these transactions might not meet the thresholds that activate merger control (Argentesi et al., 2020).

Assessing implications for competition from mergers and acquisitions under the Chinese Antitrust Guidelines

The Chinese Antitrust Guidelines prohibit entities from mergers and acquisitions that could exclude or restrict competition (Chapter IV). The Guidelines stipulate certain criteria based on which entities should declare mergers and acquisitions to regulators for competition assessment. These criteria seem to emphasise the turnover of the provider, which is calculated differently on the basis of prevailing market practices, business models, fees, commissions etc. (Article 18). In assessing the impact of the merger or acquisition on competition, the Guidelines suggest relying on a set of factors that may be peculiar to digital markets including (Norton Rose Fulbright, 2021; State Administration for Market Regulation, 2021):

- i. The market share of the entity calculated based on the number of transactions on the platform, active users, user engagement and long-term trends in market share.
- ii. The entity's control over the market, assessed based on (a) the exclusive rights over essential resources in the market, (b) the lock-in effect over consumers, (c) the ability to access and process data, (d) the ability to penetrate or expand into other markets, (e) profitability and margins, (f) frequency and speed of technological innovation etc.
- iii. Concentration in the market, precluding the competition from other competitors, and raising barriers to market entry, market access, access to technology, IPR and access to data.
- iv. Impact on consumers in terms of price, conduct, quality of products, choice, privacy safeguards etc.

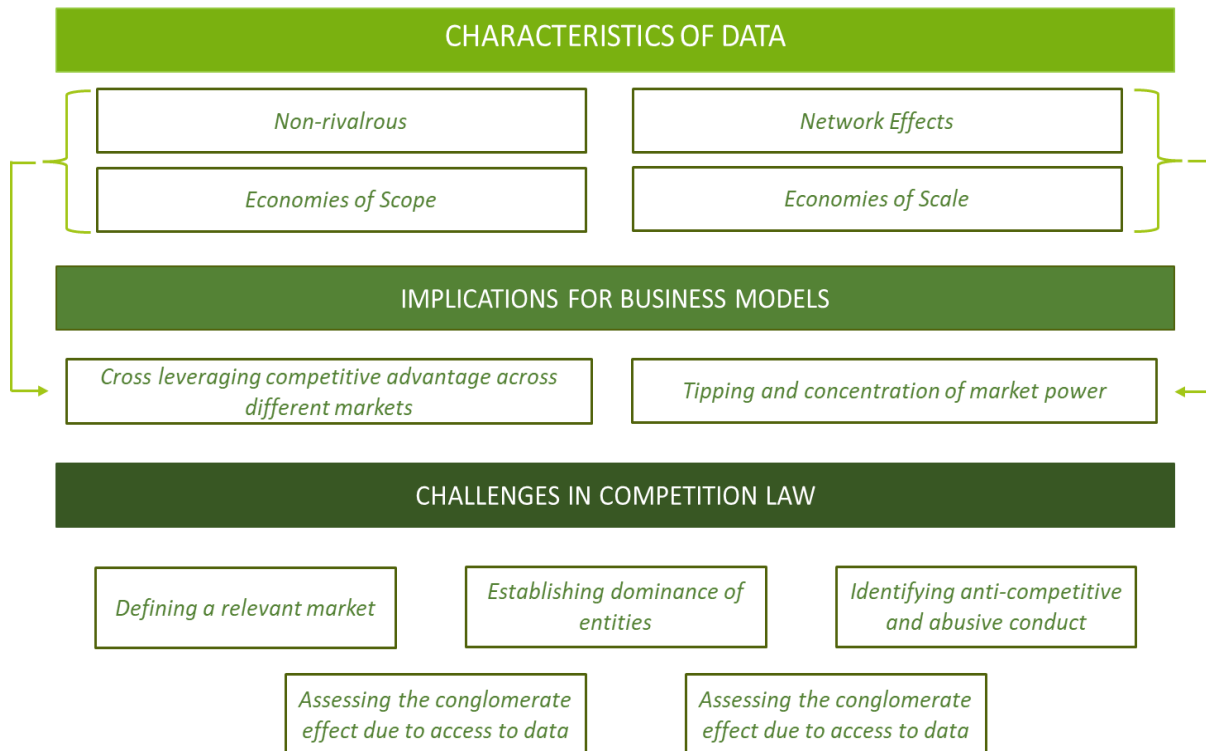
4. Conclusion

As more consumers move towards participating in the digital economy, issues of misuse of their personal data, protection of privacy, targeting of financial products etc. become pertinent. We already know of several harms to consumers that can potentially occur during the use of digital services. These harms could be new and specific to digital platforms or could be existing harms that are magnified by the nature of large-scale data processing (Prasad, 2019). In the case of the digital economy, where the market may be limited to a few large providers, there is the possibility of innovation being stifled, customer choice being reduced and general monopolistic behaviour from entities (Soursourian & Plaitakis, 2019). Given the unfolding of these possibilities in real-time, it becomes important for regulators to note both the nature and magnitude of impacts created by these entities in the market.

As such in this primer, we begin by outlining the factors differentiating digital markets from traditional markets. We find that because of technological advancements, data and its processing have become central to the functioning of digital markets. Data distinguishes itself from other traditional inputs of production by inducing network effects and economies of scale, as well as enabling economies of scope because of its non-rivalrous nature. This results in entities in the digital economy being able to exhibit a competitive advantage across several markets simultaneously, enabling them to collect even more data to expand into ever newer markets. Access to strategic information or data is also used by entities to integrate various levels of the supply chain and limit the competitive power of rivals in the market. Additionally, the network effects of data allow entities to improve the value of their offerings to consumers, which creates a positive feedback loop. This in concert with economies of scale enables them to cater to additional users at minimal cost. This contributes to tipping of the market where it

becomes efficient for one firm to cater to larger number of people, thus reducing the competitive pressure that can be exerted by rivals. This is summarized in Figure 1.

Figure 1: Summary of the competition dynamics in digital markets



However, traditional methods of identifying and assessing competition issues are sometimes inefficient or ineffective when it comes to digital markets. Traditional tests like the SSNIP test have limited usefulness because of zero-pricing practices followed in digital markets. The absence of price makes identifying relevant markets and assessing dominance difficult for regulators. In turn, these challenges make determining anti-competitive and abusive practices more difficult. New approaches are being proposed and developed by experts and competition regulators to overcome these challenges. The primer discusses a few prominent approaches among these, that are beginning to emphasise non-price factors such as costs incurred by consumers, quality of products offered to consumers and access to essential resources for competing entities (like access to data, technology, and platforms). This primer, thus, discusses the interplay between the inherent characteristics of data, its implications for data intensive businesses, and ensuing competition concerns.

References

- Ahmadinejad, A., Nazerzadeh, H., Saberi, A., & Skochdopole, N. a. (2019, September). *Competition in Ride-Hailing Markets*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3461119
- al., G. e. (2020). The role of Artificial Intelligence and Data Network Effects for Creating User Value . *Academy of Management Review*.
- Amit, R., & Zott, C. (2001). Value Creation in e-business. *Strategic Management Journal* , 22(6-7), 493-520.
- Anderson, R., Kovacic, W., Muller, A., Salgueiro, A., & Sporysheva, N. (2020). Competition Policy and the Global Economy: Current Developments and Issues for Reflection. *George Washington Law Review*, 88(6). Retrieved from <https://www.gwlr.org/competition-policy-and-the-global-economy/>
- Argentesi, E. e. (2020, March). *Tech-over: Mergers and Merger Policy in Digital Markets*. VoxEU. Retrieved from <https://voxeu.org/article/mergers-and-merger-policy-digital-markets>
- Armstrong, M. (2005, May). *Competition in Two-Sided Markets*. Retrieved from Department of Economics, University College London: <https://discovery.ucl.ac.uk/id/eprint/14583/1/14583.pdf>
- Arnold, R., Hildebrandt, C., & Taş, S. (2020, January). *European Data Economy: Between Competition and Regulation*. Retrieved from WIK-Consult: https://www.wik.org/fileadmin/Studien/2021/European_Data_Economy.pdf
- Australian Competition & Consumer Commission. (2019, June). *Digital Platforms Inquiry: Final Report*. Retrieved from Australian Competition & Consumer Commission: <https://www.accc.gov.au/system/files/Digital%20platforms%20inquiry%20-%20final%20report.pdf>
- Banerjee, P. (2021, September 03). *Apple to let some apps bypass App Store fees*. Retrieved from Livemint: <https://www.livemint.com/companies/news/apple-to-let-some-developers-communicate-alternative-payment-modes-on-their-apps-11630568357191.html>
- Baye, M. R., & Prince, J. (2020, October 04). *The Economics of Digital Platforms: A Guide for Regulators*. Retrieved from Global Antitrust Institute: <https://gaidigitalreport.com/2020/10/04/the-economics-of-digital-platforms-a-guide-for-regulators/>
- Bharti Airtel Limited v. Reliance Industries Limited and Anr., Case No. 03 of 2017 (Competition Commission of India 2017). Retrieved from <https://www.cci.gov.in/sites/default/files/3%20of%202017.pdf>
- Britannica. (n.a.). Excludability.
- Buchanan, J. (1965). An Economic Theory of Clubs. *Economica*, 32(125), 1-14. Retrieved from <https://d1wqtxts1xzle7.cloudfront.net/37994208/15L-with-cover-page-v2.pdf?Expires=1632427998&Signature=TOLWGlek-0fLzZGkKreyxnOk3Dy7o~~bfAU47Q9o3JxxApw4cPTzw0vaHoMdvJ8YHgIMW~~3bXghQ998BBulrp~mMY8yCuVn1z0uYQ9dwelozlZxYF10Xw3WOF~AJL-T7KBHZLInONceU2K3qGbGcu6->

- Bundeskartellamt. (2016). *Competition Law and Data*. Retrieved from https://www.bundeskartellamt.de/SharedDocs/Publikation/DE/Berichte/Big%20Data%20Papier.pdf;jsessionid=7FB133BBC6378657E90C71FA092AD2C1.2_cid387?__blob=publicationFile&v=2
- Bundeskartellamt. (2019, February 06). *Facebook, Exploitative business terms pursuant to Section 19(1) GWB for inadequate data processing*. Retrieved from Bundeskartellamt: https://www.bundeskartellamt.de/SharedDocs/Entscheidung/EN/Fallberichte/Missbrauchsaufsicht/2019/B6-22-16.pdf?__blob=publicationFile&v=4
- Caillaud, B., & Jullien, B. (2003). Chicken & egg: competition among intermediation service providers. *RAND Journal of Economics*, 34(2), 309-328. Retrieved from <https://www.rchss.sinica.edu.tw/cibs/pdf/CaillaudJullien.pdf>
- Cao, L. (2017). Data Science: A Comprehensive Overview. *ACM Computing Surveys*, 50(3)(43), 1-42. Retrieved from <https://arxiv.org/abs/2007.03606>
- Competition Cooperation Project. (2018, March). *Challenges to the Antitrust Laws Presented by the Digital Market*. Retrieved from https://competitioncooperation.eu/wp-content/uploads/2018/04/Xie-Lin_EN-1.pdf
- Corporate Finance Institute. (n.a.). Non-rivalrous Goods. Retrieved from <https://corporatefinanceinstitute.com/resources/knowledge/economics/non-rivalrous-goods/>
- Crémer, J., de Montjoye, Y.-A., & Schweitzer, H. (2019). *Competition policy for the digital era*. Retrieved from European Commission: <https://ec.europa.eu/competition/publications/reports/kd0419345enn.pdf>
- Deloitte. (n.a.). *What is Digital Economy? Unicorns, Transformation and the Internet of Things*. Retrieved from <https://www2.deloitte.com/mt/en/pages/technology/articles/mt-what-is-digital-economy.html>
- DePamphilis, D. (2011). Introduction to Mergers and Acquisitions. In *Mergers and Acquisitions Basics: All You Need to Know*. Elsevier Inc. Retrieved from <https://www.sciencedirect.com/topics/economics-econometrics-and-finance/economies-of-scope>
- Digital Competition Expert Panel. (2019, March). *Unlocking digital competition: Report of the Digital Competition Expert Panel*. Retrieved from GOV.UK: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf
- Dvara Research. (2020). *Regulating Data-driven Finance: Conference Proceedings*. Retrieved from Dvara Research: <https://www.dvara.com/research/wp-content/uploads/2020/11/Conference-Proceedings-from-the-Fourth-Dvara-Research-Conference-2019.pdf>
- Eavis, P., & Lohr, S. (2020, August 19). *Big Tech's Domination of Business Reaches New Heights*. Retrieved from The New York Times: <https://www.nytimes.com/2020/08/19/technology/big-tech-business-domination.html>

- European Commission. (2015, November). *Regulatory Environment for Platforms, Online Intermediaries, Data and Cloud Computing and the Collaborative Economy*. Retrieved from Conseil National du Numérique: https://cnnumerique.fr/files/uploads/2015/11/PositionCNNum_ConsultationonplatformsEU Commission.pdf
- European Commission. (2018, July 18). *Antitrust: Commission fines Google €4.34 billion for illegal practices regarding Android mobile devices to strengthen dominance of Google's search engine*. Retrieved from European Commission: https://ec.europa.eu/commission/presscorner/detail/en/IP_18_4581
- European Commission. (2021, April 30). *Antitrust: Commission sends Statement of Objections to Apple on App Store rules for music streaming providers*. Retrieved from European Commission: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_2061
- European Parliament. (2015). *Challenges for Competition Policy in a Digitalised Economy*. Policy Department, Economic and Scientific Policy, Directorate-General for Internal Policies. Retrieved from [https://www.europarl.europa.eu/RegData/etudes/STUD/2015/542235/IPOL_STU\(2015\)542235_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2015/542235/IPOL_STU(2015)542235_EN.pdf)
- Evans, D. S., & Noel, M. (2005). *Defining Antitrust Markets When Firms Operate Two-Sided Platforms*. Retrieved from Noel Economics: https://www.noeconomics.com/articles/NOEL_defining.pdf
- Facebook, Inc., B6-22/16 (Bundeskartellamt February 6, 2019). Retrieved from https://www.bundeskartellamt.de/SharedDocs/Entscheidung/EN/Entscheidungen/Missbrauchsaufsicht/2019/B6-22-16.pdf?__blob=publicationFile&v=5
- Facebook/WhatsApp, COMP/M.7217 (European Commission October 3, 2014). Retrieved from https://ec.europa.eu/competition/mergers/cases/decisions/m7217_20141003_20310_3962132_EN.pdf
- Fast Track Call Cab Pvt. Ltd. & Meru Travel Solutions Pvt. Ltd./ANI Technologies Pvt. Ltd., Case No. 6 & 74 of 2015 (The Competition Commission of India 2015). Retrieved from <https://www.cci.gov.in/sites/default/files/6%20%26%2074%20of%202015.pdf>
- Feijóo, C., Gómez-Barroso, J.-L., & Aggarwal, S. (2016). Economics of big data. In J. M. Bauer, & M. Latzer (Eds.), *Handbook on the Economics of the Internet* (pp. 510-526). Retrieved from <https://www.elgaronline.com/view/edcoll/9780857939845/9780857939845.00034.xml>
- Filistrucchi, L. (2018, January 12). *Market Definition in Multi-Sided Markets*. Retrieved from OECD: [https://one.oecd.org/document/DAF/COMP/WD\(2017\)27/FINAL/en/pdf](https://one.oecd.org/document/DAF/COMP/WD(2017)27/FINAL/en/pdf)
- Floridi, L. (2010). *Information: A Very Short Introduction*. Oxford: Oxford University Press.
- Fortuny, J. d., Martens, D., & Provost, F. (2013, December). Predictive Modelling with Big Data. *Mary Ann Liebert, Inc.*, 1(4). Retrieved from Mary Ann Liebert, Inc.: <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjlrzG7pbzAhU36XMBHZ8HAscQFnoECAIQAQ&url=https%3A%2F%2Fwww.liebertpub.com%2Fdoi%2Fpdf%2F10.1089%2Fbig.2013.0037%3Fdownload%3Dtrue&usg=AOvVaw3fAbaiS5Psz0kRCKSfgjm5>

- Google Android, AT.40099 (European Commission July 18, 2018). Retrieved from https://ec.europa.eu/competition/antitrust/cases/dec_docs/40099/40099_9993_3.pdf
- Google Search (Shopping), AT.39740 (European Commission June 27, 2017). Retrieved from https://ec.europa.eu/competition/antitrust/cases/dec_docs/39740/39740_14996_3.pdf
- Google Search (Shopping), Case AT.39740 (European Commission June 27, 2017). Retrieved from https://ec.europa.eu/competition/antitrust/cases/dec_docs/39740/39740_14996_3.pdf
- Haftor, D. M., Climent, R. C., & Lundstrom, J. E. (2021). How machine learning activates data network effects in business models: Theory advancement through an industrial case of promoting ecological sustainability. *Journal of Business Research*, 131, 196-205. Retrieved from <https://reader.elsevier.com/reader/sd/pii/S014829632100254X?token=2AE7F0DF61D249A132ECBA5BFBF608F477310DC3F2A188F8F7D2A1A9BFF6B77133D25876AEEC3AF667E5C01BE2CC71A4&originRegion=eu-west-1&originCreation=20211028115026>
- Harshita Chawla v. WhatsApp Inc. and Ors, Case No. 15 of 2020 (Competition Commission of India 2020). Retrieved from <https://www.casemine.com/judgement/in/5faa80ed4653d02a0b132284>
- Hjørland, B. (2019). *Data: With big data and database semantics*. Retrieved from ISKO Encyclopedia of Knowledge Organization: <https://www.isko.org/cyclo/data>
- Hoffmann-La Roche & Co. v. Commission of the European Communities, Case No. 85/76 (European Court of Justice February 1979). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:61976CJ0085&from=EN>
- IDC & Open Evidence. (2017, February 1). *European Data Market SMART 2013/0063*. Retrieved from key4biz: https://www.key4biz.it/wp-content/uploads/2018/04/SMART20130063_Final-Report_030417_2.pdf
- In Re: Updated Terms of Service and Privacy Policy for WhatsApp Users, Suo Motu Case No. 01 of 2021 (Competition Commission of India 2021). Retrieved from https://www.cci.gov.in/sites/default/files/SM01of2021_0.pdf
- Investopedia. (n.a.). *What are Economies of Scope*. Retrieved from <https://www.investopedia.com/terms/e/economiesofscope.asp>
- Investopedia. (n.a.). *Which Inputs are Factors of Production?*. Retrieved from [investopedia.com/ask/answers/032715/what-inputs-are-considered-be-factors-production.asp](https://www.investopedia.com/ask/answers/032715/what-inputs-are-considered-be-factors-production.asp)
- Ismail, Z. (2019, July 12). *Egypt: Egyptian Competition Law Overview*. Retrieved from Mondaq: <https://www.mondaq.com/antitrust-eu-competition-/824900/egyptian-competition-law-overview>
- Jones, C. I., & Tonetti, C. (2020). Nonrivalry and the Economics of Data. *American Economic Review*, 110(9), 2819-2858. Retrieved from https://christophertonetti.com/files/papers/JonesTonetti_DataNonrivalry.pdf
- Jullien, B., & Sand-Zantman, W. (2019, September 24). The Economics of Platforms: A Theory Guide for Competition Policy. *TSE Digital Center Policy Papers Series*, 01. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3502964

- Katz, M. L., & Shapiro, C. (1985). Network Externalities, Competition and Compatibility. *American Economic Review*, 75, 424-440.
- Kaushik, A. (2019, June). *Competition Law and Digital Economy: Identifying Emerging Challenges*. Retrieved from Centre for WTO Studies, Indian Institute of Foreign Trade: <http://wtocentre.iift.ac.in/workingpaper/WorkingPaper52.pdf>
- Khan, L. (2017). Amazon's Antitrust Paradox. *The Yale Law Journal*(126:710), 710-805. Retrieved from <https://digitalcommons.law.yale.edu/cgi/viewcontent.cgi?article=5785&context=ylj>
- Lewis, R. A., & Rao, J. M. (2014, September 18). *The Unfavorable Economics of Measuring the Returns to Advertising*. Retrieved from SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2367103
- Madiega, T. (2020, December). *Regulating digital gatekeepers: Background on the future digital markets act*. Retrieved from European Parliamentary Research Service: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/659397/EPRS_BRI\(2020\)6593_97_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/659397/EPRS_BRI(2020)6593_97_EN.pdf)
- Mandrescu, D. (2018, November 17). *Applying (EU) competition law to online platforms: Reflections on the definition of the relevant market*. Retrieved from SSRN: <https://poseidon01.ssrn.com/delivery.php?ID=1440690240010690860071231010951020990260130910780220710980850950311150290811130301090160570070321100131171261170980001260830301060330870140221130671020291130640880910670150810801161020780270270671080040071060960>
- MCX Stock Exchange Ltd v National Stock Exchange of India Ltd and Anr, Case No. 13/2009 (Competition Commission of India June 23, 2011). Retrieved from https://www.cci.gov.in/sites/default/files/MCXMainOrder240611_0.pdf
- Meru Travels Solutions Private Limited v. Competition Commission of India, Appeal No. 31/2016 (Competition Appellate Tribunal December 7, 2016). Retrieved from <https://www.casemine.com/judgement/in/5a6576b44a9326024ad96946>
- Microsoft Case, COMP/C-3/37.792 (European Commission April 21, 2004). Retrieved from https://ec.europa.eu/competition/antitrust/cases/dec_docs/37792/37792_4177_1.pdf
- Monopolkommission. (2015). *Competition Policy: The Challenge of Digital Markets*. Retrieved from https://www.monopolkommission.de/images/PDF/SG/SG68/S68_summary.pdf
- Mukul, P. (2020, September 20). *Explained: Paytm App back on Google Play Store - Here's why it was removed*. Retrieved from The Indian Express: <https://indianexpress.com/article/explained/explained-paytm-goes-from-play-store-how-are-you-affected-6601262/>
- OECD. (2020). *Abuse of dominance in digital markets*. Retrieved from OECD: <https://www.oecd.org/daf/competition/abuse-of-dominance-in-digital-markets-2020.pdf>
- Omaar, H. (2021, September 13). *No, The Data Economy is not a Barter Economy*. Center for Data Innovation. Retrieved from <https://datainnovation.org/2021/09/no-the-data-economy-is-not-a-barter-economy/>
- Organisation for Economic Co-operation and Development. (2013, June 18). *Exploring Data-Driven Innovation as a New Source of Growth*. Retrieved from Organisation for Economic Co-

operation and Development: https://read.oecd-ilibrary.org/science-and-technology/exploring-data-driven-innovation-as-a-new-source-of-growth_5k47zw3fcp43-en#page1

Organisation for Economic Co-operation and Development. (2014, October). *Data-driven Innovation for Growth and Well-being*. Retrieved from Organisation for Economic Co-operation and Development: <https://www.oecd.org/sti/inno/data-driven-innovation-interim-synthesis.pdf>

Organisation for Economic Co-operation and Development. (2014). *The digital economy, new business models and key features*. Retrieved from Addressing the Tax Challenges of the Digital Economy: <https://www.oecd-ilibrary.org/docserver/9789264218789-7-en.pdf?expires=1634889637&id=id&accname=guest&checksum=97E35CA89635CDBA25BD77E93303BE6B>

Organisation for Economic Cooperation and Development. (2016). *Big Data: Bringing Competition Policy to the Digital Era*. Retrieved from [https://one.oecd.org/document/DAF/COMP\(2016\)14/en/pdf](https://one.oecd.org/document/DAF/COMP(2016)14/en/pdf)

Organisation for Economic Co-operation and Development. (2017, May 11). *Key Points of the Hearing on Disruptive Innovation*. Retrieved from Organisation for Economic Co-operation and Development: [https://one.oecd.org/document/DAF/COMP/M\(2015\)1/ANN8/FINAL/en/pdf](https://one.oecd.org/document/DAF/COMP/M(2015)1/ANN8/FINAL/en/pdf)

Organisation for Economic Co-operation and Development. (2018, November 23). *Quality considerations in the zero-price economy – Note by BIAC*. Retrieved from Organisation for Economic Co-operation and Development: [https://one.oecd.org/document/DAF/COMP/WD\(2018\)151/en/pdf](https://one.oecd.org/document/DAF/COMP/WD(2018)151/en/pdf)

Organisation for Economic Co-operation and Development. (2019, June 2019). *Conference on Competition and the Digital Economy: Co-chairs' Summary*. Retrieved from Organisation for Economic Co-operation and Development: <https://www.oecd.org/daf/competition/Co-chairs%20Summary%20-%20Conference%20on%20Competition%20and%20the%20Digital%20Economy.pdf>

Organisation for Economic Cooperation and Development. (2020). *Abuse of Dominance in Digital Markets*. Retrieved from <https://www.oecd.org/daf/competition/abuse-of-dominance-in-digital-markets-2020.pdf>

Organisation for Economic Cooperation and Development. (2020). *Digital Competition Policy: Are Ecosystems Different?* Retrieved from [https://one.oecd.org/document/DAF/COMP/WD\(2020\)96/en/pdf](https://one.oecd.org/document/DAF/COMP/WD(2020)96/en/pdf)

Organisation for Economic Co-operation and Development. (2020). *Digital Disruption in Banking and its Impact on Competition*. Retrieved from Organisation for Economic Co-operation and Development: <https://www.oecd.org/daf/competition/digital-disruption-in-banking-and-its-impact-on-competition-2020.pdf>

Organisation for Economic Co-operation and Development. (n.a.). *Economies of Scale*. Retrieved from Glossary of Statistical Terms: <https://stats.oecd.org/glossary/detail.asp?ID=3203>

Parker, G., Petropoulos, G., & Van Alstyne, M. (2020). Digital Platforms and Antitrust. In *Oxford Handbook of Transformational Economic Governance*. Retrieved from <https://www.bruegel.org/wp-content/uploads/2020/11/WP-2020-06-1.pdf>

- Parker, G., Van Alstyne, M. W., & X, J. (2016). *Platform Ecosystems: How Developers Invert the Firm*. Boston University Questrom School of Business.
- Parsheera, S., Shah, A., & Bose, A. (2017). *Competition Issues in India's Online Economy*. National Institute of Public Finance and Policy. Retrieved from https://www.nipfp.org.in/media/medialibrary/2017/04/WP_2017_194.pdf
- Pechstein / International Skating Union, KZR 6/15 (Federal Court of Justice in Civil Matters (BGHZ) June 07, 2016). Retrieved from https://www.tas-cas.org/fileadmin/user_upload/Pechstein___ISU_translation_ENG_final.pdf
- Plaitakis, A. (2019). *Digital Data and Competition Issues*. BFA Global. Retrieved from https://bfaglobal.com/wp-content/uploads/2020/01/Competition-DFS_03_Digital-Data-Competition-Issues_Final.pdf
- Portuese, A. (2019, November 17). *The Rise of Precautionary Antitrust: An Illustration with the EU Google Android Decision*. Retrieved from Competition Policy International: <https://www.competitionpolicyinternational.com/the-rise-of-precautionary-antitrust-an-illustration-with-the-eu-google-android-decision/>
- Prasad, S. (2019, May 06). *Defining "Harm" in the digital ecosystem*. Retrieved from Dvara Research Blog: <https://www.dvara.com/blog/2019/05/06/defining-harm-in-the-digital-ecosystem/>
- Raychaudhuri, T. (2020, December). Abuse of dominance in digital platforms: An analysis of Indian competition jurisprudence. *Competition Commission of India Journal on Competition Law and Policy*, 1, 19-27.
- Recke, M. (2021, February 25). *The Dual Strategy of Horizontal and Vertical Integration*. Retrieved from <https://nextconf.eu/2021/02/the-dual-strategy-of-horizontal-and-vertical-integration/#gref>
- Redman, T. C. (2016, September 22). *Bad Data Costs the U.S. \$3 Trillion Per Year*. Retrieved from Harvard Business Review: <https://hbr.org/2016/09/bad-data-costs-the-u-s-3-trillion-per-year>
- Renard, F., Zhang, J., & Wang, M. (2021, April 22). *China issues record antitrust fine: SAMR sheds further light on its position towards the online sector*. Retrieved from Allen & Overy: <https://www.allenoverly.com/en-gb/global/news-and-insights/publications/china-issues-record-antitrust-fine>
- Rusche, C. (2019). Data Economy and Antitrust Regulation. *Intereconomics*, 54, 114-119. Retrieved from [Intereconomics: https://www.intereconomics.eu/contents/year/2019/number/2/article/data-economy-and-antitrust-regulation.html](https://www.intereconomics.eu/contents/year/2019/number/2/article/data-economy-and-antitrust-regulation.html)
- Saba, Y. (2019, December 29). *Egypt competition watchdog approves Uber acquisition of Careem with conditions*. Retrieved from Reuters: <https://www.reuters.com/article/us-careem-m-a-uber-idUSKBN1YX07Q>
- Sandler, T., & Cornes, R. (1986). *The theory of externalities, public goods and club goods*. Cambridge: Cambridge University Press.
- Schepp, N.-P., & Wambach, A. (2016). On Big Data and Its Relevance for Market Power Assessment. *Journal of European Competition Law & Practice*, 7(2), 120-124. Retrieved from <https://academic.oup.com/jeclap/article-abstract/7/2/120/2357794>

- Schroeder, R., & Halsall, J. (2016). Big data business models: Challenges and opportunities. *Cogent Social Sciences*, 2:1(1166924).
- Shapiro, C., & Varian, H. R. (2008, January). *Information Rules. A Strategic Guide to the Network Economy*. Retrieved from ResearchGate: https://www.researchgate.net/publication/200167344_Information_Rules_A_Strategic_Guide_to_The_Network_Economy
- Singh, M. (2020, June 19). *How Reliance Jio Platforms became India's biggest telecom network*. Retrieved from Techcrunch: https://techcrunch.com/2020/06/19/how-reliance-jio-platforms-became-indias-biggest-telecom-network/?gucounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlMmNvbS8&guce_referrer_sig=AQAAADzWMjgk1i3UuyQfbxWxx6Y_EibQsrFbJ8fh7p_mnj6DSZChG534NJRpeNbIMFg1HpkLWf4cnp
- Smichowski, B. C. (2018, June). Is ride-hailing doomed to monopoly? Theory and evidence from the main US markets. 162. *Revue d'économie industrielle* [Online]. Retrieved from <https://journals.openedition.org/rei/6987>
- Soursourian, M., & Plaitakis, A. (2019, November). *Fair Play: ensuring Competition in Digital Financial Services*. Retrieved from CGAP: https://www.cgap.org/sites/default/files/publications/2019_11_Working_Paper_FairPlay.pdf
- State Administration for Market Regulation. (2021, February 7). *Antitrust Guidelines of the Antimonopoly Committee of the State Council on the Economic Field of Platforms*. Retrieved from State Administration for Market Regulation: http://gkml.samr.gov.cn/nsjg/fldj/202102/t20210207_325967.html
- Suarez, F. F., & Lanzolla, G. (2005, April). *The Half-Truth of First-Mover Advantage*. Retrieved from Harvard Business Review: <https://hbr.org/2005/04/the-half-truth-of-first-mover-advantage>
- The Competition Commission of India. (2009, August 20). *The Competition Commission of India (Determination of Cost of Production) Regulations, 2009*. Retrieved from India Code: https://upload.indiacode.nic.in/showfile?actid=AC_CEN_22_29_00005_200312_1517807324781&type=regulation&filename=determinations_of_cost_of_production__0.pdf
- The Data Economy Lab. (2020, March 31). *Data & Competition: Reorganising the Distribution of User Data*. Retrieved from The Data Economy Lab by Aapti Institute: <https://thedataeconomylab.com/2020/03/31/data-and-competition-reorganising-the-distribution-of-user-data/>
- The Global Antitrust Institute . (2020, November). *Report on the Digital Economy*. Retrieved from The Global Antitrust Institute : https://gaidigitalreport.com/wp-content/uploads/2020/11/The-Global-Antitrust-Institute-Report-on-the-Digital-Economy_Final.pdf
- United Nations Conference on Trade and Development. (2019). *Competition Issues in the Digital Economy*. Retrieved from https://unctad.org/system/files/official-document/ciclpd54_en.pdf
- United Nations Conference on Trade and Development. (2019). *Digital Economy Report 2019*. Retrieved from United Nations Conference on Trade and Development: https://unctad.org/system/files/official-document/der2019_en.pdf

- United Nations Conference on Trade and Development. (2021, April 28). *Competition law, policy and regulation in the digital era*. Retrieved from United Nations Conference on Trade and Development: https://unctad.org/system/files/official-document/ciclpd57_en.pdf
- Varian, H. R., Farrell, J., & Shapiro, C. (2004). *The Economics of Information Technology: An Introduction*. Cambridge: Cambridge University Press.
- Whyte, C. (2020, September 11). *Competition Law's Challenges in Regulating Big Data*. Retrieved from KSLR Commercial & Financial Law Blog: <https://blogs.kcl.ac.uk/kslrcommerciallawblog/2020/09/11/competition-laws-challenges-in-regulating-big-data-campbell-whyte/>
- Wismer, S., & Rasek, A. (2017, November). *Market definition in multi-sided markets*. Organisation for Economic Co-operation and Development. Retrieved from <https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WD%282017%2933/FINAL&docLanguage=En>
- World Economic Forum. (2019, December). *Competition Policy in a Globalized, Digitalized Economy*. Retrieved from World Economic Forum: http://www3.weforum.org/docs/WEF_Competition_Policy_in_a_Globalized_Digitalized_Economy_Report.pdf
- Yang, S. Y. (2018). Rethinking Modes of Market Definition for multi-Sided Platforms. *International Journal of Trade, Economics and Finance*, 9(4), 164-169. Retrieved from <http://www.ijtef.org/vol9/608-AEB3004.pdf>
- Zhu, F., & Iansiti, M. (2019, January-February). Why Some Platforms Thrive and Others Don't. *Harvard Business Review*, pp. 118-125. Retrieved from Harvard Business Review: <https://hbr.org/2019/01/why-some-platforms-thrive-and-others-dont>
- Zingales, L., & Lancieri, F. M. (2019). *Stigler Committee on Digital Platforms*. Stigler Center for the Study of the Economy and the State, Chicago Booth. Retrieved from <https://www.publicknowledge.org/wp-content/uploads/2019/09/Stigler-Committee-on-Digital-Platforms-Final-Report.pdf>