

DIGITAL PLATFORMS IN THE GLOBAL ECONOMY

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Abstract. *Globalization of the economy has led to a significant increase in competition in various areas. One of the key business tools that allows organizations to gain a strong competitive advantage is digital platforms. Hence, this study considers impact of digital platforms on changes in the global market and global competition. To do this, this work analyzes the trends of platformization of the economy its impact on the structure of the world market, and considers the peculiarities of value formation on platforms. An attempt was also made to classify the consequences and risks of using platforms in countries with different levels of economic development. The digital platform environment can be potentially dangerous for competition. Through network effects, platforms can gain market power and abuse their dominant position, for example by imposing exclusivity agreements on their suppliers or demanding predatory prices from their competitors. However, in various cases of competition, platforms were not considered dominant in the relevant market. The innovative capabilities of global platforms will increase. Countries with a lower level of digitization may lose the ability to develop a local innovation environment, as all resources and developer potential will be concentrated on work for other countries. This has the potential to significantly increase the gap in the level of not only economic, but also innovative and digital development.*

Keywords: *Globalization, digital platform, competition, network effect, value chain.*

Introduction

A key trend in the digital economy has been the emergence and rapid growth of several large global digital platforms characterized by data-driven and digital intelligence business models. The ranking of the world's largest companies by market capitalization has undergone significant changes: while a decade ago it was dominated by multinational companies in the oil and gas industry and engineering, today companies specializing in intelligence and digital data have become leaders. Their specialization has also changed, as now they are mainly either Internet companies (for example, Alphabet (Google), Meta) or software developers (Apple, Microsoft). (CompaniesMarketCap, n.d.)

This unprecedented and significant specialization shift reflects hyper-dynamic international competition in traditional and new markets for goods and services. It should be noted that over the past decade, companies leveraging the power of platform business models have grown significantly in size and scale. Platform ecosystems are being strengthened by the digitization of products, services and business processes, and the global market landscape is changing.

In this regard, the aim of this study is to assess the impact of digital platforms on the transformation of global markets. To achieve this goal, the factors of the dominance of digital platforms in world trade and the challenges and opportunities that arise before developing economies in the process of market transformations are considered.

The main body of the paper

Digital platforms are an important aspect of current international competition, as they create new challenges and may require the revision of competition policy guidelines (Tirole, 2017, p. 379). A comparison of the composition of the world's top 20 companies (by sector and industry) by market capitalization shows dramatic changes. For example, in 2010, the top 20 included seven companies from the oil, gas and mining sectors (35% of the total), while there were only three companies from the technology and consumer services sector, including digital platforms, and another three companies from the financial sector. In 2022, the situation has changed significantly: the number of technology and consumer services companies in the top 20 has increased to eight (40%), and financial companies to seven. Only two mining companies remain in the top 20 in 2022. Four of the top 10 companies in 2022 were not even in the top 100 in 2010 (Amazon, Alibaba, Meta, Tencent).

Even more remarkable is the change in the following aspect. In 2010, oil and gas companies accounted for 36% of the top 20 in terms of total market capitalization, financial services companies 18%, and technology and consumer services 16%. In 2021, the share of the latter increased to 56% and the share of financial services to 27%, while the share of oil and gas companies in the total market capitalization decreased considerably over the same period to just 7% (UNCTAD, 2021). The world's leading digital companies are highly concentrated geographically: of the world's 70 most valuable digital platforms, most are based in the USA, followed by Asia (particularly China).

Economic value is traditionally closely associated with the production of goods and services. The key questions to determine this value relate to the methods of production, the distribution of products and the reinvestment of the income from this production (this is the productive transformation of materials into goods and services that create wealth potentially distributable in society) (Mazzucato, 2018, p. 287). In this context, the main actors in the economy are producers, consumers and the government, and the main objective is the production of goods and services from various resources (labor and capital).

In the new business models of the digital economy, two emerging and related forces are increasingly driving value creation: platformization and monetization of the rapidly growing volume of digital data. Digital platforms are central players in the economy and digital data is a key resource that leads to the creation of value. Their interaction has a significant impact on the receipt of added value and its value in turn. While the digital economy is just beginning to emerge in most developing countries (Iqbal et al., 2021), evidence of its impact on value creation and distribution is still limited. It is important to determine the ways in which companies create value and remove obstacles to it, which will make it possible to accurately assess the potential for creating and distributing value, the modalities of its modernization and its management, and the forms of its reception.

The concept of a platform is not new and, in essence, it refers to mechanisms that bring together a set of parts for interaction. Parker et al. (2016) define a platform as "...a business based on creating opportunities for evaluative interaction between external producers and consumers. The platform provides an open infrastructure with participation of all participants in these interactions and sets the conditions for their management" (p. 11).

Digital platforms provide mechanisms for these online interactions, and can be:

- intermediaries, when they connect different groups of people, i.e., sides of multilateral markets (Baldwin & Woodard, 2009, p. 19; Gawer, 2009). Thus, Facebook connects users, advertisers, developers, companies and others; Uber – passengers and drivers;
- infrastructures that can rely on different sides of markets. For example, users can design Facebook profile pages and software developers can create apps for Apple's App Store. In fact, certain businesses can only be part of a platform business itself. In the case of Apple, its activities are mainly focused on the sale of high-end consumer goods, i.e., traditional business.

Platforms can be organized and developed according to their functionality, their scope (at the level of companies, industries or the economy as a whole), their geographical orientation and their degree of openness. An important difference concerns their underlying operations, which can be divided into two main categories (Koskinen et al., 2018):

1. Transaction platforms are two-sided/multi-sided platforms or marketplaces that provide an infrastructure, usually an online resource, that supports the exchange between different (Gawer, 2014) entities and is closely linked to transformations in the digital economy (these platforms have become the main business models of large digital companies such as Amazon, Alibaba, Meta and eBay, as well as those that provide digital assistance – Uber, Didi Chuxing, Airbnb).
2. Innovation platforms (engineering or technology platforms) are how companies, industries or sectors use “shared components and subsystems within a product family” (Krishnan & Gupta, 2001).

At the industry level, these platforms provide ways to share common projects and interact across sectors. Examples of these platforms include operating systems (e.g., Android or Linux) and technology standards (e.g., MPEG video) that provide a common approach for businesses across a sector/industry to interact. At the enterprise level, these platforms were created as part of product offerings, adding functionality for their specific models.

Digitalization profoundly affects the formation of the global market structure in the following areas:

- direct communications (refusal to mediate). Digitization directly connects supply and demand via digital platforms;
- growth in the number of small businesses in traditional sectors (digitalization has significantly lowered barriers to entry in many markets, especially in consumer goods and services; small businesses easily connect to a large consumer base at low prices, leading to a market shift from large business dominance to growing small business influence);
- growing oligopoly among global platforms: while barriers are lower in traditional sectors, they are higher in emerging industries, especially digital platforms, and only a few companies can dominate. For example, Alibaba and Tencent dominate the mobile payments industry and are branching out into other parts of the financial services supply chain (Zhang & Chen, 2019, p. 11). This structure has the advantage of economies of scale or information scale, but can also lead to price distortions in the absence of competition.

A new landscape is emerging on digital platforms, which are divided into two main groups: for-profit platforms and non-profit platforms (UNCTAD, 2018). Non-commercial platforms are likely to be small compared to for-profit platforms. Uber is classified both as an e-commerce platform (ride services are ordered online) and as gig work (this term refers to irregular and one-time work, performed, for example, via Internet applications). Similarly, Airbnb includes e-commerce (lodging booked online) and is representative of gig work. Some platforms are versatile.

Platforms allow more efficient use of physical resources or time. Often accessed through mobile apps, they combine and aggregate supply and demand in ways previously unavailable (faster, cheaper, and easier to coordinate), including in geographies and service sectors where low density once acted as an obstacle.

Among the main characteristics of digital platforms are: the provision of an intermediary infrastructure between different groups of users; reliance on network effects as more users give rise to more users, leading to monopoly tendencies; and the use of cross-subsidies (the practice in which one division of a business reduces the price of a good or service, which is offset by a price increase in another division).

Platforms also tend to outsource jobs and services. In addition, platform owners set the rules for the development of products and services, as well as interactions with the market, i.e., access

conditions and prices. The most important value of digital platforms is related to the data extracted by users, which can be further analyzed, used and sold to third parties.

A unique and fundamental feature of the platform is the network effects (more users of the platform creates even more users and therefore the cost of the platform increases), the dynamic of which has been noted by Evans and Gawer (2016, p. 5) to be a “self-sustaining cycle of growth.” The competitive advantages of the most successful platforms are considered to be global connectivity to the Internet and software engineering (Evans et al., 2008). These network effects can be direct (e.g., Facebook user growth) and indirect, where growth in the number of users on one side of the platform leads to their growth on the other side (user growth of video games drives the growth of video game developers).

The fast-growing nature of digital platforms is confirmed by the explosive growth of their market capitalization over the 2015–2020 period from \$4.3 trillion to \$7.2 trillion, with seven superplatform companies accounting for around two thirds of that value. The market capitalization of each of the seven platforms exceeded \$250 billion, and in 2021 the market capitalization of Apple, Microsoft, and Amazon exceeded \$1 trillion (CompaniesMarketCap, n.d.). At the same time, the conditions for the formation of the platforms differ numerically, despite the fact that they pursue common goals of data control and market dominance. While in the USA platforms emerged from a free market, although some government support was provided to them, in China the creation of platforms was supported by aggressive government policy, which included the protection of national companies against competition from global platforms (Bieliński, 2018; Thun & Sturgeon, 2017).

The dominance of a number of global digital platforms in the market is determined by several key factors, among which the most important is the achievement of monopolization based on: a platform that will drive out competitors; and the exceptional ability of the platforms to extract, analyze and control data (the intermediary function of the platforms allows them to accumulate data on all the interactions that traditional companies do not have, and this data can be converted into digital knowledge, can reduce costs, and can improve products compared to competitors). The literature indicates that when there are no radical technological changes that can challenge the business models of global platforms, their success relies on “virtual cycles of network effects” (UNCTAD, 2021, p. 85).

One of the key factors in the growth of any digital platform has to do with so-called network effects – the benefits that platform users receive from additional users who join (Van Alstyne et al., 2016). Platforms involve two or more partners. These can be, for example: accommodation providers and tourists (Airbnb); advertisers and consumers (Meta); or merchants, buyers, payment processors and logistics providers (Alibaba). Thus, in addition to direct network effects, platforms also have indirect (cross-sectional) network effects, where the expansion of one side of the market increases the added value for the other group. The presence of network effects is an incentive for the rapid growth of successful platforms, as additional users make these platforms more attractive. Network effects can also generate blocking effects – participants are more likely to stay on the platform rather than switch to competing platforms, which can pose problems for public authorities to ensure that markets remain competitive.

A platform-centric company has a big advantage in a data-driven economy. Platform owners, acting as intermediaries and providers of certain types of infrastructure, can extract all data relating to events that have occurred between different users of the platform. Thus, the growth of digital platforms is significantly linked to their ability to collect and analyze digital data. While digital platforms can be involved in a variety of economic activities and sectors, the collection (or extraction, when done without the knowledge or consent of users) of digital data is an essential part of their business models. Digital platforms can help create the value of interaction between different parties of the platform (producers and consumers of various goods and services). However, at their core, their effective functioning depends on digital data, and

the main source of their value comes from using this data in intelligent ways. Large digital platform companies see their data pools and data processing capabilities as a key competitive advantage. Thus, how specific firms extract value from such data is key to understanding and influencing the process of creating and retaining added value in the digital economy.

For digital platforms and for digital transformation itself, data and digital intelligence play a key role. At the same time, the genesis of the digital economy lies in an unprecedented amount of comprehensive machine-readable information. These digital data are the consequences of different types of personal, social and professional activities carried out on digital platforms, which increasingly constitute the digital substrate of economic and social activities in almost all sectors.

Along with the increase in data, converting these data into useful information for better decision-making poses additional challenges. A whole new value chain is developing around companies supporting the gathering of data-driven insights, including data harvesting (to provide new data sources), data storage, data modeling, data analysis and data visualization. At the lower levels of the data value chain (DVC), the information content is limited and therefore the opportunities for value creation are also low.

The result of this DCS is digital intelligence, which can inform companies (and other organizations) in their efforts to make decisions and implement innovations. Additionally, data may be used to improve algorithms used for automated decision making in the development of products, processes or services (Mayer-Schönberger & Cukier, 2013). Digital intelligence assumes a certain centrality and/or abundance of artificial or non-human intelligence, causing transformational impacts – for example, in the form of intelligent manufacturing, capturing a wide range of technologies with impressive intellectual results, such as analytics and algorithms.

Digital intelligence can be used for various purposes. From an economic point of view, it can have direct value as a service or be used in production processes. Productivity in the digital economy is determined in many ways by the appropriate application of digital intelligence. In particular, high economic returns are associated with appropriate skills and control. Thus, digital intelligence becomes digital capital, which results from: 1) access to large amounts of relevant data; 2) controlling their use; 3) the ability to process and transform data into digital intelligence; and 4) their application in manufacturing processes. The economic value of this digital capital is formed through various forms of data monetization (Figure 1).

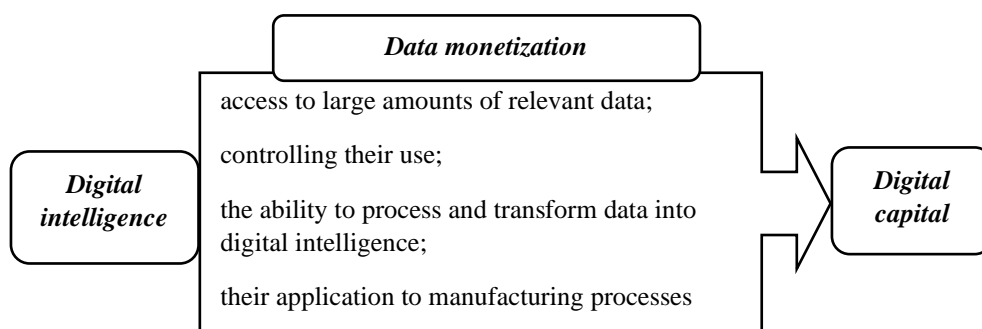


Figure 1. Data monetization – the process of transforming digital intelligence into digital capital

Some digital platforms appear to provide various products and services for free, but these transactions still create value for platform owners because users and consumers provide them with various aspects of their personal data (location, preferences, relationships and personal behavior). Value is created after data is transformed into digital intelligence and monetized through business use. The interests and behavior of digital platforms depend on how they

monetize data to generate revenue. There are four main types of trading platforms (Srnicsek, 2017):

- ad platforms are companies such as Google and Meta that rely heavily on advertising revenue (advertising accounts for over 80% of Twitter and Google's revenue, and nearly 100% of Facebook and Snapchat's revenue). These platforms are strongly encouraged to extract and store personal data essential to their targeted advertising campaigns. Privacy disputes are a natural feature of this business model;
- e-commerce platforms offer online marketplaces with lower transaction costs for buyers and sellers (Amazon, Alibaba and eBay). Digital marketplaces often generate revenue by charging fees for each transaction. Each market sets its own commission, and this varies widely. Apple, for example, charge a 30% commission on each seller (Chung, 2018). These platforms can also use the data they collect from buyers and sellers to offer better services;
- product platforms aim to transform a traditional product into a rented service. For example, Mobike took the standard purchase of a bicycle and turned it into a bicycle rental service. With the growth of the Internet of Things, this type of platform will become more and more useful;
- cloud platforms such as Alibaba Cloud, Amazon Web Services (AWS), Google Cloud Platform and Microsoft Azure. They provide as a service various hardware, software and developments needed in the data-driven economy. There are also specialized platforms for the manufacturing industry (e.g., Predix from General Electric or MindSphere from Siemens) and agriculture (e.g., XeonView from Monsanto and MyJohnDeere from John Deere). Recently, AI has become an important part of these services. For businesses around the world, cloud computing promises cheaper, more secure, simpler and more flexible services than in-house information technologies. For developing countries in particular, this could reduce barriers to accessing advanced and large-scale computing needs (Greengard, 2010). As a result, cloud platforms provide the basic infrastructure of the 21st-century global economy.

It is important to note that individual data has little or no value. Value occurs when data is collected in large volumes and processed to inform and make data-driven decisions by individuals, businesses, governments, and other organizations. Thus, it is the ability of digital platforms to aggregate, process, transfer, store and analyze data that allows them to generate value. Therefore, digital data and digital platforms can be seen as two sides of much of the value creation that occurs in the digital economy.

In order to analyze the implications of global platforms on inequality, it is necessary to consider how information comes to have economic value. Weber (2017, p. 88) distinguishes, first, the raw data received by suppliers; second, information products produced by value-added companies; and third, the consumers of these information products. In particular, Facebook acts both as a provider of data and as a producer of information products based thereon, and may also return these products to users in the social interaction system and sell them to companies as advertising space. A kind of fundamentally new global data value chain (GDVC) is being formed, in which most countries are data providers, and only large platforms can receive valuable information products from them (and monetize them).

Such unequal participation of countries in the new international division of labor leads to previously unknown market distortions, since platforms in this context ensure absolute dominance. Traditional companies, in turn, will be forced to share their own data with global platforms in exchange for access to the latest applications and technologies. Despite the well-known comparatively low price of labor in developing countries, this will always be subject to automation, and the gap in the data economy between platforms and these countries will deepen, as will their addiction. We call this phenomenon information colonialism, when the place of the vast majority of developing countries in the international division of labor will remain solely as exporters of raw data and importers of finished information products.

Developing countries should use global electronic transaction platforms to support domestic production and exports, not just imports of goods, as the latter drive up consumer spending. An important issue is to ensure the access of developing countries to global platforms, which remains unequal due, for example, to the lack of solutions in these countries in the field of international payments.

The benefits of global digital platforms are also seen in terms of developing countries' use of their infrastructure, on the basis of which digital businesses and innovations can grow, stimulating the development of entrepreneurship. In this context, the role of innovative platforms that constitute the economic environment of content producers, as well as transactional platforms that simplify user interaction, is important. Gawer (2014) notes that an important system-forming function of innovation platforms lies in "generative digital innovation processes" – these platforms use differentiated, complex and innovator-centric design strategies that aim to build an innovation ecosystem.

The digital innovation process is not discrete, and the digital foundation of platforms can be used in the future without additional costs. At the stage of introducing a digital product into the infrastructure of a global platform, this product can be scaled with the global digitization process, and this mechanism is applicable to an innovation platform on which an ecosystem for improving innovations (combinatorial) has been created. Innovators and entrepreneurs in developing countries must have the skills and access to build on this foundation.

Generally speaking, there are a number of risks of an even greater lag of developing countries in the digital economy. As the innovation capacity of global platforms grows, lagging countries may lose the ability to develop local innovation ecosystems as developer resources and capabilities become increasingly focused on supporting technologies in other regions.

Competitive dynamics between global digital platforms are geographically multi-layered and impact platform expansion. Economies of scale make it difficult for startups in developing countries to compete with global platforms for product categories and markets. Therefore, startups are forced to seek out those niche markets that global platforms either do not want to or cannot serve.

Conclusions

Our research has shown that digital platforms can transform global markets and increase competition while improving consumer and societal well-being. However, they can be perceived as unfair competitors by traditional companies, since these platforms generally do not meet the same regulatory requirements. Antitrust authorities around the world oppose overregulation of the platform economy, which could reduce its potential benefits.

In the design of platforms for traditional enterprises, a key place is occupied by: technologies, which involve the formation of complex information systems, methods of machine learning and artificial intelligence; the organization of a complex digital ecosystem; and the design and development of organizational capital and management systems. A centralized approach to intra-firm control will not suffice in this case, as much of the value creation takes place outside the traditional boundaries of the firm.

The environment of digital platforms can be potentially dangerous for competition. Due to network effects, platforms can acquire market power and abuse their dominant positions, for example by imposing exclusivity agreements on their suppliers or by extorting predatory prices from their competitors. However, in various cases of competition, platforms were not considered dominant in their respective markets.

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