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Means of Reducing Contractual Controls by Suppliers of Mobile Applications in the Global Value Chain of Digital Platforms exemplified by Kaspersky and Spotify Access to Apple Ecosystem

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ABSTRACT

Background:

Mobile applications are complementary products that add value to mobile devices' customers and customize the functionality of smartphones. Digital platforms like Apple App Store distribute mobile applications of independent developers and get income from the commission on in-app purchases made by users. Platforms dictate technological standards and limit app suppliers' ability to capture payments over OS stores. They exploit bargaining power in negotiations and subsequent formal governance in contracts. Some software suppliers try to challenge the industry's status quo to increase their income and limit the abuses of dominance by the platforms. One of the means to reduce contractual controls in a mobile applications global value chain is to file a complaint on to competition authorities. Recent cases of Spotify and Kaspersky against Apple in the European Union and Russia are important in understanding the core issues of the mobile applications market and the public search for a solution.

Aim:

The objective of the work is to research the global value chain of mobile applications, understand contractual controls of digital platforms over mobile app suppliers, and the means to increase the power of independent software developers.

Methods:

Primary research methods will be (a) work with primary and secondary sources of data (b) literature review on a global value chain contractual controls, (c) an interview, (d) a survey, and (e) a case study of Kaspersky and Spotify filing complaints to competition authorities to affect Apple's power.

Results:

An expected outcome is a profound understanding of the value chains of mobile applications and contractual controls between platform owners and independent software developers. The work will provide an overview of mobile app stores' market shares, power in the value chain, and captured value of the participants. Conclusions about costs and effectiveness of filing competition law complaints against platforms are essential for managerial decisions that mobile applications market participants make.

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LIST OF ABBREVIATIONS

CSO - Civil Society Organisations

CSR - corporate social responsibility

DCT - Dynamic Capability Theory

DMA – Digital Markets Act

DPE – Digital Platform Enterprise

DPE – digital platform enterprise

EU – the European Union

FAS – the Federal Antimonopoly Service of Russian Federation

GAP - Global Alliance Perspective

GATT - The General Agreement on Tariffs and Trade

GVC – Global Value Chain

GVC – global value chain

IB – international business

IE - International Entrepreneurship

IPT - Internationalization Process Theory

KSK - Kaspersky Safe Kids

MDM - Mobile device management

MNC – multinational corporation

MVP - minimum viable product

OLI Ownership, Location, Internalization theory

OS – operating system

R&D - research and development

TNC – transnational corporation

VC – value chain

WTO – world trade organization

1. INTRODUCTION

International business nowadays is increasingly dependent on permanent access to data and knowledge, technologies, digital infrastructures. Platforms have emerged in different industries: from retail and transportation to the distribution of mobile applications. Their emergence changes international business (IB) and the implication of basic theories of IB (Nambisan et al., 2019). They reshape the traditional approach to the creation and distribution of goods and services worldwide and drive the development of digital platform enterprises (DPEs) (Porter & Heppelmann, 2015). Platforms as a major venue for innovation, value creation, and delivery often become a central hub that forms ecosystems around them (Jacobides et al., 2018). Digital platforms play a key role in the global distribution of goods in a modern economy, and the total value of the world's top 100 platforms grew by 40% between January and October 2020 (Shaping Europe's Digital Future, 2021). DPEs help complementors distribute their goods, sharing the infrastructure and resources of digital platforms with others. Platforms bring together participants of the transaction and facilitating interactions between them by leveraging network effects, building governance structures, standards and creating value (Wen & Zhu, 2019).

Platforms are a new approach to a global value chain (GVC) concept. GVC implies networks of independent and geographically separated firms interlinked in input-output supply systems of production and marketing. They participate in value creation on different stages (Gibbon & Ponte, 2008). GVCs are characterized by the asymmetry of power distribution in the network and incentives of the leading firm to leverage the dominant position in its interests (Strange, 2011). Global Value Chain management requires governance structures that can be formal and informal. Contractual controls imposed by the membership in a value chain are codified exchanges created to govern sets of expected outcomes between firms. The terms that companies negotiate over and agree on when stepping into business relations reveal how the firms split competencies and resources along the GVC (Gibbon & Ponte, 2008). A platform holder is usually the strongest company in a GVC that decides on contract terms and set standardized rules for the participants. To reach an agreement on contract terms that satisfies their interests with a lead firm, complementors need to strengthen their bargaining power. There are different means to reduce negative contractual conditions for the GVC participants. They vary from joining groups of participants for joint actions (Nakanishi, 2020) and strengthening alternative distribution channels (Wang & Miller, 2019) to lobbying and filing antitrust complaints against the dominant firm. This work will be focused on the antitrust investigation as an instrument to change contractual terms of digital platforms by complementors.

Although platforms are common in different markets, there is a lack of scientific understanding of the phenomenon and subsequent governmental control. There have been recent movements towards the regulation of digital platforms in different regions, for instance, in the European Union and Russia researched in this paper. The Digital Markets Act (DMA) will apply to digital platforms on the territory of the European Union (Shaping Europe's Digital Future, 2021). In Russia, the Federal Antimonopoly Service

(FAS) is developing the fifth antimonopoly set of amendments to digital companies' regulation for submission to the government (Draft of "The Fifth Anti-Monopoly Package": Highlights, 2020).

One of the industries that functions because of platforms is the mobile applications production. According to Passport database, smartphone penetration in 2020 is 76.2% among households worldwide, reaching more than 84% in developed countries and 74% in emerging and developing regions (Euromonitor International, 2021). 14-15% of newly produced devices run on the iOS operating system (OS) with nearly the rest 86% left to Android according to IDC forecast (IDC - Smartphone Market Share - Market Share, 2018). Mobile applications are complementing goods to smart devices. The software allows users access to a variety of services and features which customize their phones and tablets to their specific needs and demands. Mobile app stores are the core channels of mobile application distribution. Consumers with Apple devices are basically limited to a single source of applications – the Apple App Store which is a gateway to the iOS ecosystem of hardware and software (Höppner et al., 2019).

When starting to produce applications for a new operating system, software developers understand that OS holders will have an outstanding share of power in the business relations as a vertically integrated company with monopolistic features (Gilbert, 2020). Tech giants play both as owners of the platforms and participants of the mobile apps market. As such, they can use their competitive advantages to eliminate competitors from the market, for instance, by predatory pricing, rejecting to list third-party services, infringing patents of small rivals, prioritizing short-term monopoly rents over the optimal interest of partners and consumers, or acting from the position "take it or leave it" during negotiations (Rey, 2020). In the mobile apps industry GVC, a platform like the Apple App Store hosts and distributes those developed applications capturing up to 30% of apps revenues only on in-app purchases (Haslam et al., 2013). Thus, the management of software companies must be aware of all the costs and benefits of entering a platform.

In this research, we distinguish several possible decisions of a software developer concerning mobile app distribution via mobile application stores. Firstly, a third-party developer can avoid entering a platform or leave it. Secondly, a software producer can enter a platform and take all the contractual terms it imposes. Thirdly, a mobile app supplier can enter the platform and try to advocate its interests in contract terms. In case of choosing the last option, a software developer might try to get support from the authorities against platforms to enhance its interests in the existing rules or lobby new regulation. The recent cases of software companies filing complaints to antitrust authorities include Kaspersky vs Apple, Spotify vs Apple, Epic Games vs Google and Apple.

Kaspersky and Spotify have applied to the antitrust authorities of their home regions against Apple. Kaspersky triggered an investigation at the Russian Federal Antimonopoly Service (FAS). The developer claimed that Apple had limited access of third-party applications to some of the information needed to support the features of parental control applications, for example, Kaspersky Safe Kids. Moreover, Apple started to add the free internal service Screen time pre-installed on all iOS devices. The new feature is partly substituting features of parental control services (Shastitko et al., 2020).

Spotify's main concern addressed to the European Commission was the 30% fee for independent app suppliers. Apple charges every in-app purchase or subscription on iOS devices with a platform tax. By terms of the agreement, Apple prohibits the promotion of paid services available through other platforms except for Apple App Store. Therefore, Spotify claimed that Apple gets an unfair competitive advantage on the market of music streaming for its application Apple Music. Spotify asked for equal rules for all the services on the platform, the availability of different payment systems for consumers, the possibility of direct communication between mobile application developers and customers without controlling intermediation from app stores side (Consumers and Innovators Win on a Level Playing Field, 2019).

Competition authorities of Russia and the European Union investigate whether Apple carried out an anticompetitive behavior, which is illegal and must be prosecuted according to local legislation (Thompson, 2020). It is also important to understand whether local antimonopoly cases can influence the positions and business of mobile apps developers in other markets.

Although there is a substantial theoretical base on global value chains and their governance, the current studies lack focus on platforms as a relatively new phenomenon of market structure. Moreover, this paper provides possible means of enhancing the bargaining power of the GVC participants. Besides the traditional ones, the help of antitrust authorities can possibly strengthen a weak position in negotiation with a lead firm. In the mobile application industry triggering antitrust investigations against platforms at local competition authorities might help third-party software developers advocate their interest. A positive court decision on abuse of dominant position by a digital platform can be also the applicable in other regions. It can become a reference case for competition regulators in other markets, which will enhance app producer business conditions.

The structure of the paper is as follows: in the theoretical part of the research definitions, concepts, and frameworks get developed. The main components of the topic are global value chains and digital platforms, their governance, and means to renegotiate contract conditions, including application to antitrust authorities. The analytical part of the work focuses on industry analysis, qualitative and quantitative research. A questionnaire of the industry management and the interview with the Kaspersky product manager support the conclusion. The two cases of Kaspersky vs Apple and Spotify vs Apple are reviewed in the qualitative part of the work as examples of possible usage of competition law against a strong distributor in a GVC. The study highlights the purposes of management deciding to get help from competition authorities, the decision-making process of local regulators, results, and consequences of the antitrust investigations. In the quantitative part, there are calculations of losses of the platform because of non-compliant behavior of the complementors. In addition, the research provides a possible model for the platform entrants. The main tested hypothesis is that mobile apps suppliers can reduce contractual controls of platforms and by applying to competition authorities.

2. THEORY

This part of the work provides a literature review and key theoretical concepts on the topic of the dissertation. The section includes definitions and frameworks of global value chains, platform enterprises, contracts and negotiations over them, and antitrust regulation. It ends with the construction of hypotheses that get checked in the analytical part.

2.1 Definitions, Frameworks, Theories on Global Value Chain

2.1.1 Networks and Global Value Chain

The value chain concept was initially defined by Porter (1985). The term describes the full range of activities to bring a product from idea to consumer, including manufacturing, logistics, marketing, sales, and subsequent services. Every step adds more value to the final product, and companies are eager to maximize their value, keeping costs low. A value chain can extend beyond a single firm so that the concept might be used in supply chains and distribution networks (Porter, 1985).

While value chains can be found within a single company, global value chains (GVCs) are usually divided among several enterprises. They include firms, networks of their subsidiaries (Gereff et al., 2005). According to Kano (2018) and Gibbon and Ponte (2008), the GVC term is applied to the management of independent and geographically dispersed value chains of multinational enterprises (MNEs). They are interlinked in input-output supply systems of production and marketing. Multinational enterprises "complete [business activities in GVC] internally or through outsourcing, non-equity agreements". GVCs are a form of business network governance on an international level (Dyer, 1997). They are usually managed by transnational corporations in various types of industries, from traditional manufacturing (e.g., textile) to advanced modern technologies. The main goal of building a GVC is to use the firm’s obtained and created knowledge effectively, strengthen it with the capabilities of companies from different locations. (Cantwell and Mudambi, 2005; Tallman and Chacar, 2011). Apple is an example of a global factory GVC with a dispersed production and internalized and outsourced activities. Some factors are produced by third-party suppliers, and research and development (R&D) laboratories are located in several places around the world (Kano, 2018).

Classical internalization theories focus on transaction cost economics (e.g., Buckley and Casson, 1976; Rugman, 1981; Rugman and Verbeke, 1992). The critical questions that a multinational enterprise usually solves include location choice, entry mode, knowledge transfer, and organizational design (Nambisan et al., 2019). Some classic internalization theory papers also touch on the governance issues that a multinational company faces when entering a new market (Buckley and Casson, 1976; Rugman, 1981).

In new internationalization theories, the GVC term is closely associated with a firm's decision to operate cross-border. New international business (IB) theories, including the ones by Hennart (2009), Rugman and Verbeke (1992, 2004), and Verbeke and Kano (2016), focus on firm-specific advantages (FSAs) that determine the organization and work of multinational enterprises. FSAs used to be protected by

firms that wanted to integrate all the cross-border activities within one company. Conversely, firms are now ready to extend their operations outside a single firm. The development of modern technologies, patent protection, and new management practices helped to decrease transaction costs significantly. Large vertically integrated MNEs started to de-internalize their business, creating new forms of business networks and managing parts of the value chain through new mechanisms: exports, licensing, joint ventures, strategic alliances, and wholly-owned subsidiaries (Kano, 2018). Many international companies nowadays are open to the global market and ready to exchange FSAs with other companies (Jacobides and Hitt, 2005; Liesch et al., 2012). Intangible operations help MNEs to develop and internalize knowledge, access skills, capabilities, and information of other GVC participants (Mudambi et al., 2007).

The leading firm in a GVC might externalize its operations to the extent that it is lucrative and convenient for the business. The externalization of functions depends on:

1) A need to maximize shareholders' value and comply with financial markets' indicators to fit analysts' views on a suitable company organization. For instance, in the research on GVC conducted by Gibbon and Ponte (2020), lead firms with capital traded on the stock market were pushed to externalize inventory management. They needed to reduce administration costs to correspond with financial benchmarks.

2) Cultural assumptions and regulative frameworks in inter-firm relations. For instance, the main company in a value chain controls the quality of production by setting standards and admitting third-party suppliers in the network after formal certification (Gibbon and Ponte, 2020).

GVC is a business network that connects various participants in one system of interdependent actors (Jacobides et al., 2018). According to graph theory, networks are characterized by such metrics as:

1. Density - number of existing relations in the network to potential ones (Stockman, 2001:10509-10514);
2. Segmentation – a ratio of how many point pairs are at a distance of two or more relations (direct connection) to how many pairs of points are at a distance of three or more relations (Baerveldt and Snijders, 1994);
3. Closeness - shortest paths to other nodes (Oldham et al., 2019);
4. Centrality - measurement of unit's ties to other units (Marsden, 2004:819-825).

Researchers distinguish different types of business networks:

- Asymmetrical networks that are usually built by a leading firm around an opportunity or threat for the participants (Rowley, 1997; Doz et al., 2000);
- Emergent or organically grown clusters that have no distinct leader and are usually built around specific identity criteria (Doz et al., 2000).

By Rowley (1997), GVCs are asymmetrical low-density and high-centrality networks that have a leading orchestrating company at the center (Rugman & D'Cruz, 1997, 2000).

Participation in business networks means that companies are affected by various possible network effects. These can be positive or negative (*Why Some Platforms Thrive and Others Don't*, 2020):

- Same side or direct network effects. They are effective for the participants on the same side of the market, for example, producer – producer;
- Cross-side or indirect network effects. They are effective for either side of the market on the other, for example, producer-consumer.

Network externalities lead to a product dependency on the number of network participants. When several members surpass a threshold, the value of the good starts to increase or decrease rapidly. Network-specific advantages are both peculiar to the network and cannot be separated from it (Dyer & Singh, 1998). The success of business networks is explained by a balance of competition and cooperation between the firms-participants (Ottati, 1994). Competition between suppliers leads to a higher degree of specialization and division of labor. This results in increased productivity compared to single large, vertically integrated companies. On the other hand, cooperation helps to pool risks and enhance common performance by leveraging each other's distinctive capabilities, skills, and information (Loasby, 1994).

2.1.2 Members of a Global Value Chain: Functions, Value Creation and Power Division

GVCs are characterized by the membership. The roles, responsibilities and value division of GVC participants differ significantly. Rugman and Cruz (2000) state that GVC members are included in permanent interactions and rely on long-term relations that imply more components than usual commercial relations. The main groups of participants in a GVC are the orchestrating firm and the complementors.

Power asymmetry in a GVC means that an orchestrating firm has a strategic position in the value chain (Kano, 2018). Transnational corporations (TNCs) usually take roles of O rchestrators in supply chains, outsourcing many of their activities and retaining innovation and branding for inhouse development (Aguiar de Medeiros & Trebat, 2017). Due to power asymmetry, the O rchestrator controls partners in the network and can get excessive rents (Strange, 2011). Rents of leading firms in GVCs have different natures: technological rents protected by strengthened IPR (intellectual property rights) laws; financial rents that are covered by transfer pricing and debt financing schemes, tax avoidance schemes (Aguiar de Medeiros & Trebat, 2017).

The Orchestrating firm has several roles in a GVC. In particular, it:

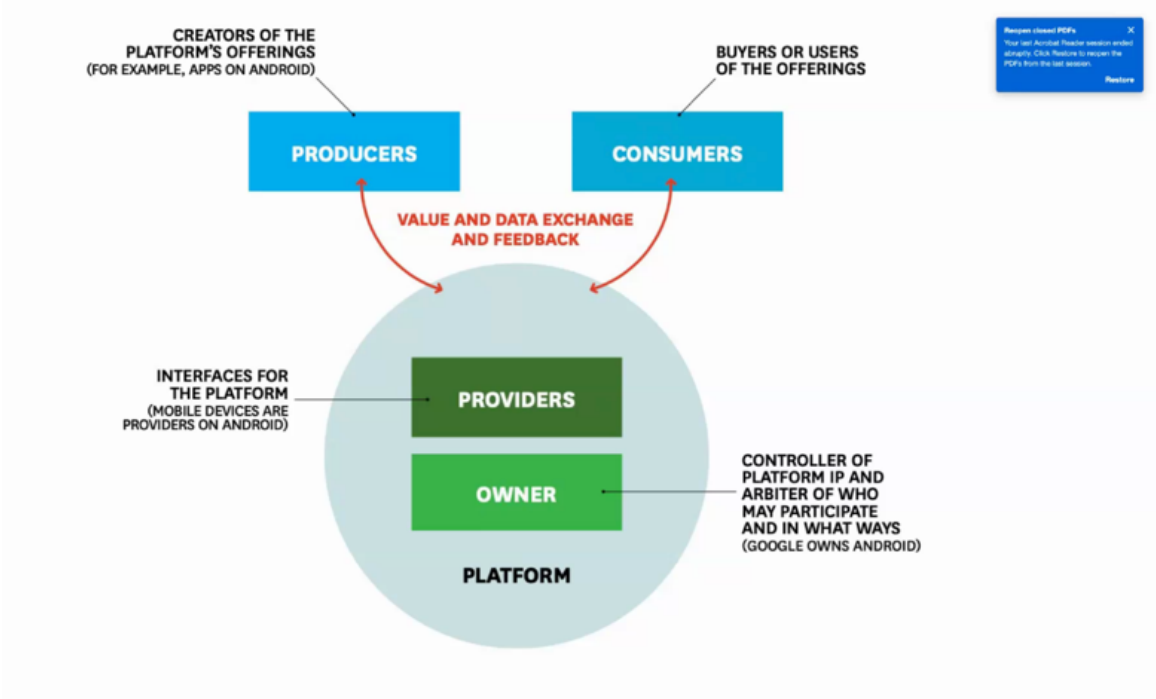
1. Decides the list of participants and manages contracts with the GVC members. As a Selector, the O rchestrator chooses which firms are eligible for participating in the network according to their capabilities, calculating the value of their joining. (Rugman and Verbeke, 2003);
2. Governs GVC participants' strategies to achieve common goals (Rugman and D'Cruz, 1997);
3. Organizes seamless coordination between upstream and downstream firms of the network and external partners (Snow et al., 1992);
4. Sets the rules and divides the value captured between the participants to keep the network working in a long-term period. The value may be exclusively captured by a leading company, not wishing to share it with the rest of the network firms (Yamin, 2011).

In return for giving up some of the strategic decisions to the GVC leading firm, other participants get access to FSAs: brand names, technologies, organizational capabilities (Kano, 2018). Verbeke and Bussche (2000) also list alliance-specific advantages available exclusively to the GVC partners, such as inter-organizational capabilities and network-specific advantages. Participation in a GVC is a component of the multihoming strategy choice of complementors (Nambisan et al., 2019).

At the lower stages of production in GVC, there is usually fierce competition between suppliers and workers, often located in less developed countries, for lower wages and profit margins. Conversely, on the top stages, companies compete in control of innovation, finance, marketing (Aguiar de Medeiros & Trebat, 2017). An example of a modern GVC is Apple. Researchers find a distinct power asymmetry in the company in favor of the Orchestrating firm. However, strong counterparts can sometimes change the power division to bilateral dependence (Kano, 2018).

2.1.3 Digital Platforms as a Form of a Global Value Chain

Digital technologies reshape traditional approaches to supply chains, distribution networks, and value chains. Digitalization leads to the shortening and centralization of global value chains due to more significant advantages of bundling production (Strange & Zucchella, 2017).



Picture 1.1 The Members of a Platform Ecosystem (Pipelines, Platforms, and the New Rules of Strategy, 2016)

Gawer and Cusumano (2002), Gawer (2014) defined platforms as a "shared set of technologies, components, services, architecture, and relationships that serve as a common foundation for diverse sets of actors to converge and create value". In the publication by Cusumano et al. (2019), the authors argue that digital platform firms "use digital technologies and connectivity to exploit and control digitized resources that reside beyond the scope of the firm". Platforms diminish the meaning of location, borders, and industries for their participants located in different parts of the world and coordinated by the platform owner (Buckley, 2009). These effects are achieved as platform enterprises incorporate information from different

collaborators dispersed geographically, and they can adjust value proposition to the local demands of the global market (Nambisan et al., 2019). Value in digital platforms is created by facilitating commercial transactions between multiple sides of product and service markets brought together on the platform with strong network effects (Cusumano et al., 2019; ITIF Technology Explainer: What Are Digital Platforms?, 2018).

From an International Business digital perspective, platform enterprises (DPEs) are often researched as an approach to shared resources that affect owner-specific advantages in the OLI (Ownership, Location, Internalization) paradigm (Dunning, 1980) and theory of internalization (Rugman & Verbeke, 1992). Regarding OLI, nascent firms choose platforms to go global and diminish vulnerable position in the home market by acquiring ecosystem-specific advantages and resources. At the collective level, digital platforms allow fostering firm-specific and location-specific advantages with resource-sharing and complementarity mechanisms. In internalization theory, DPEs enable firms to scale their business and enter foreign markets. Companies seek externalization via DPEs, obtaining ecosystem specific advantages, and internalize them to firm-specific advantages. In DPEs, participants orchestrate resources rather than own them with the help of interfirm governance structures (Nambisan et al., 2019).

The Digital platform enterprises concept also extends other theories in their approaches to IB in terms of building knowledge and relationships, creating and delivering value to global customers (Nambisan et al., 2019):

- Internationalization Process Theory (IPT): with DPEs infrastructure and resources, the firms' international expansion is not necessarily related to previous international experience. Risk and cost-sharing can help new companies enter the global market and become MNEs.
- Dynamic Capability Theory (DCT): DPEs focus on pursuing demand-side opportunities, such as the interests and tastes of diverse international customers. DPEs enhance internal knowledge sharing and co-creation of goods and services for flexible responses to market changes.
- International Entrepreneurship (IE) perspective: DPEs with collective benefits of ecosystems help startups become "born-globals" and early internationalize their products and services. However, against powerful ecosystem owners, new players need to develop coopetition with other participants. Otherwise, they lack bargaining power and control. To reduce risks, participants can choose a multihoming strategy and be present on multiple platforms.
- Global Alliance Perspective (GAP): participants of DPEs can be highly specialized and differentiated from other platform members. Simultaneously, they all as a system enrich knowledge sourcing, creation, and sharing.

Platforms are described by three main features (Gawer, 2020):

1. Economically, they are characterized by their multi-sidedness;
2. Technically, they have a digital interface to exchange data between the different sides;

3. From the resources point of view, assets, labor, and activities on a platform are often controlled without formal ownership or employment.

Formally, platforms can be divided into two categories (Cusumano et al., 2019):

- Transaction, focusing on their intermediary role in the exchange of already existing goods and services. They connect "buyers" and "sellers" and build their business on fees, advertising. Airbnb and Amazon Marketplace are examples of transaction platforms.
- Innovation, providing a foundation for the technological development of other participants. The value of the platform increases in line with the increasing number of contributors, as for instance, on Google's Google Play.

Digital platforms have peculiarities that make this business model particularly strong and competitive (Kennedy, 2020):

1. Considerable reduction of transaction and search costs for the participants;
2. Provision of a distribution channel or a marketplace to small suppliers thus fostering the competition by increasing the number of market participants;
3. Significant and permanent investments in R&D to improve the service for customers;
4. Data collection from platform members to constantly improve the service or enter the market themselves on a seller side;
5. Reduction of information asymmetry on the market by ranking systems for sellers and buyers;
6. Exploitation of network effects: the platform value grows the more the number of users on the supply and demand side. Platforms often have economies of scale after surpassing high fixed costs that prevent the entering of new platform holders.

Platform creation requires significant initial investments to build technical infrastructure, launch required software and attract users. However, after establishment, marginal costs decrease dramatically, and platform-based businesses are likely to become highly centralized (Kennedy, 2020). According to Farrell and Katz (2001), competition in network markets is a Schumpeterian rivalry because one' temporary monopolist' takes leadership in the market and, after some time, gets displaced by another innovator.

Platform enterprises differ from traditional firms with a pipeline approach (Van Alstyne & Parker, 2017):

1. In contrast to collecting and controlling internal resources, platforms usually orchestrate and facilitate the interaction of network participants;
2. Platforms cannot operate without interacting with user communities and populations;
3. Platforms can govern ecosystems and decide on membership;
4. Platforms are mainly in charge of ecosystem value maximization and further value distribution among the participants.

Gawer and Cusumano (2008), Parida et al. (2019), Cozzolino et al. define a platform-based ecosystem as "a network where a platform owner encourages 3rd parties to develop complementary

innovations and the resulting network of firms manifests significant interdependencies". Ecosystems are "interacting organizations, enabled by modularity, not hierarchically managed, bound together by the non-redeployability of their collective investment elsewhere". By Jacobides et al. (2018), they are complex networks with interdependencies and links in input, resources, and output that extend beyond a sum of the same contributors, which foster synergies and co-specialization (Jacobides et al., 2018) and complementarities (Adner, 2017).

Complementarity means that the involved firms gain from the synergy in resources, activities and final output. Nambisan et al. (2017) define that complementarity can be:

- Generic, when the involved participants do not have incentives to act together as a group (e.g., electricity and electric appliances);
- Unique, when the first product cannot function without the second product. Products require technical standards, and a focal firm bundles the products together as an integrator (e.g., cars and car tires);
- Value-reinforcing, when the value or utility of a product is considerably enhanced by another product and vice versa (e.g., operating systems and applications) (Alaimo et al., 2020).

Ecosystems are created to get higher returns or diminish costs, and network effects achieved give rise to market dominance. Platforms and platform-based ecosystems often thrive on-demand economies of scale and get dependent on network effects (Van Alstyne & Parker, 2017). Value in ecosystem GVC is created between tightly interlinked and permanently interacting actors (Adner, 2017).

Digital ecosystems are often built around digital platforms with networks of multi-sided, complementary, and highly interlinked participants. DPEs raise a new approach to GVCs perception (Schmidt et al., 2020). New technologies and actors' interaction in ecosystems affects the nature and location of value creation in GVCs (Dachs, 2019). GVCs in ecosystems include multiple participants from traditional suppliers and customers to other stakeholders beyond industry borders, for instance, trade associations or research institutions (Teece, 2011).

Ecosystem-specific advantages are mostly transferrable cross-border and not tied to a specific location. They are based on the shared assets of the participants, complementary contributed assets adding value to the whole system, and access to particular actors and customers. MNEs inside the ecosystem obtain internationalization advantages from participating in the ecosystem. Platform-based MNEs can enter new markets at a greater speed and with fewer resources, transferring their context-specific advantages to new international geographic locations (Nambisan, 2019).

Ecosystem participants may play many different roles, for instance, orchestrator, integrator, complementor. However, interdependencies are usually standardized for each role in the ecosystem (Jacobides et al., 2018). The participants of the platform include customers as a part of the ecosystem (Nambisan, 2019). Ecosystem owners can dictate who will participate in the network and how the revenue will be distributed among participants (Van Alstyne & Parker, 2017). According to Gulati et al. (2012), an ecosystem leader is an essential part of a system because it sets a common goal, defines roles and hierarchy

of the network participants, and "establishes standards and interfaces". A lead firm in an ecosystem is often an MNE and a key company in one of the most important value-generating areas of operations (Buckley, 2009). The Orchestrator often builds and organizes the rules of participation, manages innovation, and coordinates complementors that create and deliver value (Nambisan & Sawhney, 2011).

Although ecosystems are not completely hierarchical organizations, they demand the centralization of some critical functions. In the research conducted by Schmidt et al. (2020) managers claimed in their ecosystems GVCs centralization takes place in various forms. For example, standardized regulations, control, and research and development (R&D) are centralized by a leading firm. Core functions, such as management, sales, service, control, strategic knowledge accumulation, are consolidated in the headquarters and rarely distributed to the network (Schmidt et al., 2020).

2.2 Contractual Controls by Suppliers in Global Value Chains: a Literature Review

2.2.1 Governance Systems and Contracts in Global Value Chains

Gibbon and Ponte (2005) state that "governance in GVCs is the process of organizing activities with the purpose of achieving a certain functional division of labour along the chain resulting in specific allocations of resources and distributions of gains". A key feature of GVCs is their governance. It is closely linked to power determination and distribution in the system, as well as to the benefits from participating in the GVC, value distribution, and access to the network (Davis et al., 2018). A leading MNE in a GVC can set rules for value chain development, reduction of costs, and optimal distribution of the value in the network (Kano, 2018; Gibbon & Ponte, 2008).

Kano and Verbeke (2015), Verbeke and Greidanus (2009) argue that governing systems in MNEs should be organized to manage the company under conditions of:

1. Bounded rationality of parties - complexity of information and inability of actors to act perfectly rationally.
2. Bounded reliability of parties - economic actors are intendedly reliable, but only boundedly.
3. A need to develop better FSAs.

According to Gerrefi et al. (2005), governance in various value chains can be classified based on “complexity of the information and knowledge, ability to codify and transmit efficiently this information between the parties and capabilities of the supply base in relation to the requirements” of the exchange. There are different types of governance coordination between the parts of value chains: market, modular, relational, captive, and hierarchy. Hierarchy is usually found in vertically integrated value chains with high informational complexity, the difficulty of facilitation and codification, independent suppliers (Gerrefi et al., 2005).

In GVCs, key product and process parameters are usually set by a lead firm that controls key products and technologies (Gereffi, 1994). The lead firm in a GVC sets standards for its suppliers and customers: economic standards (quality, cost, delivery); social standards (labor standards or regulation of

corruption and CSR - corporate social responsibility); environmental standards. A lead firm creates such normative frameworks to protect its rents (Teece, 1992). Apart from rent-seeking, the lead firm may be eager to exercise control over markets of inputs or outputs, pricing, and other marketing (Davis et al., 2018). Goods created by GVCs should also comply with external parameters set by governments and international organizations (Kaplinsky, 2000). For software applications, they include, for instance, age ranking, explicit content (Humphrey & Schmitz 2001). National states also seek to monitor and sanction GVCs participants if they do not comply with national legislation - e.g., concerning corruption and compliance to product standards (Davis et al., 2018).

In general, the governance of GVCs is exercised on several different levels (Davis et al., 2018):

1. Firms in the GVC.
2. Civil Society Organisations (CSOs).
3. The Nation-State - legislation affecting the control of barriers to entry, such as competition law and IPRs, are predominantly directed at the national level.
4. Supra-National Institutions (e.g. WTO).

Socioeconomic interactions in business networks function on a mixture of strong and weak ties (Dwyer et al., 1987). Weak-tie approaches characterize arm-length relationships that need formal contracts described in transaction cost theory. Conversely, strong-tie approaches generally apply to highly interdependent relationships governed by social norms. Social norms theory and relational contracting theory generally research strong-tie approaches (Ferguson, 2005). The exchange between firms in a network can include both relational, such as trust in different forms, and transactional, defined by formal contracts, governance mechanisms (Cannon et al., 2000). Benito, Petersen and Welch (2019) state that GVCs should be governed with the use of both formal and relational coordination mechanisms. For instance, formal contracts can complement trust to secure commitments and improve the enforceability of agreements. Then, formal mechanisms allow imposing penalties on the violators that extend beyond "non-legal sanctions such as reputation costs or the loss of relationship-specific assets". Consequently, codified agreements preserve the important features of relations between firms (Mouzas & Ford, 2012; Stinchcombe, 2001).

Governance of interfirm relations in organization theory ranges from contractual to procedural governance coordination (Sobrero & Schrader, 1998) and in strategic management from formal to informal self-enforcing governance (Dyer & Singh, 1998). Arrighetti, Bachmann and Deakin (1997) distinguish between gentlemen agreements - legally unenforceable - and written and legally binding contracts as regulating agreements between companies. Formal contracts state the terms and conditions of further behavior of the parties in detail, while relational mechanisms are based on trust and often only draw an outline. Consequently, negotiations over contract terms and further control of compliance with them differ for the involved parties. Separate legal and economic entities are unified in networks by mutually dependent long-term relationships. Companies share their risks, exchange information and knowledge when their sequential mutual exchange is supported by a long-term contract or a looser agreement (Arrighetti et al.,

1997). In general, the contractual environment of companies depends on the social, institutional, and organizational spheres where companies operate (Granovetter, 1985).

Contractual governance implies "hard, explicit, formal, and written" binding legal agreements that specify the roles and obligations of their participants (Poppo & Zenger, 2002). Contractual controls, by definition, are a type of formal control that sets guidance and ensures compliance with the defined rules and procedures, constraints, and expected performance by participants of the contract (Li et al., 2009; Das & Teng, 2001). In networks with multiple but weak ties, a high number of participants may result in excessive bounded rationality in decision making due to high variance in the purposes of the participants (Jones et al., 1997). Contracts diminish adverse effects of bounded rationality, uncertainty and opportunistic behavior of business parties and help to control exchanges, govern formal hierarchy (Stinchcombe, 1985) and interactions and, thus, mitigate risks (Lusch & Brown, 1996). Eller (2020) claims that GVCs increasingly require contract law to manage distribution and participation under the globalization process and changes in material, technological or informational infrastructure. Nunn (2007) provides a list of contract-intensive industries. Industries with the highest level of contract intensity usually include companies that produce finished high technology products.

Contract law has several functions in business exchanges (Arrighetti et al., 1997):

- Planning – it defines borders within which the participants plan their interaction and manage possible risks;
- Incentive – it helps to control the behavior of the parties by providing a set of sanctions for deviations from the agreed obligations. The sanctions in different contracts vary and might include compensation of damages for breach of contract or specific performance of contractual promises.

The terms of formal agreements often need discussion and bargaining before the sides of the relations sign them. Contract obligations have a tying nature in subsequent business interactions. Sometimes a strong party can impose its conditions on a weak side of a contract without negotiations with a principle "take it or leave" (Rey, 2020). One of the hypotheses of this work is that independent application suppliers can influence contractual conditions with digital platforms that distribute their products and services.

2.2.2 Negotiation Process over Contracts and Bargaining Power in GVCs

Contracts help to organize the relations between the participants and facilitate interactions between the different parties. In business networks with a high level of centrality, obligations and contract enforcement are positively related (Antia & Frazier, 2001). However, legal contracts often require aggressive negotiations to settle the issues provoked by them (Joshi & Arnold, 1998). Lusch and Brown (1996) state that misused contracts or contracts with non-optimal conditions can create conflicts and harm the performance of the participants. Rousseau and Parks (1993) also suggest that, while contracts enhance consensus and cooperation, dispute and disagreement between the contract participants are sometimes unavoidable. The incompleteness of contracts is a substantial problem for differentiated and contract-intensive products, with heavy contract flows that require state enforcement. For them, the asymmetric

information problem is more severe under conditions of "absence of equitable protection and credible enforcement" (Dollar & Kidder, 2017). More powerful participants can include clauses that allow for renegotiation of the conditions in case of adverse changes in the value chain (Bacchiega et al., 2016).

The sides negotiate contract conditions to achieve agreement on different business questions. One of the main questions is value distribution among value chain members. Eliashberg's model (Eliashberg, 1986) considers that the share of value captured by business process members "do[es] not depend on their negotiating power but only on their risk-aversion measurements". Nevertheless, Shang and Yang (2015) suggest that profit-sharing conditions in contracts depend on the network members' negotiating powers. According to Feng and Lu (2013), a typical assumption in bargaining theories is that firms negotiate over how to share the created value. However, contract discussion might also include specific terms, e.g., unit wholesale prices.

More powerful contract participants can reach the desired business conditions by offering an explicit contract. For instance, the side with more negotiation power can affect the supplier's commitment to spend more on product quality improvement (Zhang et al., 2008). In general, lead firms try to achieve standard contracts in the relationship with other supply-chain members (Cafaggi, 2016).

In the networks with strong links between the participants, agents can collectively act against a principal in case of disagreement on contractual conditions (Fombrun, 1986). If companies decide on coopetition, there are two benefits of collective bargaining power (Nakanishi, 2020):

1. Intensified pressure as a larger group. Several participants as a group can achieve positive outcomes in negotiations with a strong player that would be unachievable if they acted separately;
2. Improved persuasiveness with consensus between competitors. As an organized group, participants show harmonized demands and reduce the concerns of a strong opponent.

A well-functioning legal system can help GVC sides in contract bargaining by the provision of equitable rights protection and contract enforcement. Thus, the legal institutions of a country might be an important parameter for GVC's participants. WTO report highlights that "countries with weaker institutions deepen their upstream GVC participation to countries with better institutions. The growth of GVC participation is positively related to better state institutions. Institutional quality is an important determinant of an industry's ability to fragment its production processes across international borders" (Dollar & Kidder, 2017).

Public and private regulators on domestic and international markets shape contractual terms for GVCs participants. Contracts inside GVC are mainly defined by transnational private regulation. However, a GVC leader may also choose other instruments to increase the legal and economic uniformity of contracts. Concerning contractual enforcement, Cafaggi and Iamiceli (2014) state that GVCs' participants use internal mechanisms as committees and dispute resolution instruments to solve disputes due to deep "structural interdependencies" and aim for a stable system of GVC participants. Thus, the role of courts, judiciary, and

arbitration as last resort instruments is limited, and corrective solutions are prioritized over damages and specific performance.

Nevertheless, in some cases, GVC participants might seek the help of authorities and the judiciary system in the protection of their interests. This creates an additional complexity to GVCs contractual controls. If a dispute arises, the companies concerned can choose among different countries and judiciaries for dispute resolution. In this respect, global enterprises have an internationalization advantage as they operate in different markets (Zekos, 2003).

In legal terms, various principles can be used to define an international company's jurisdiction (Zekos, 2003):

1. State where headquarters and top management are located.
2. State where the company is registered.
3. State where the company asked for legal identity.

MNEs' home market and center of economic activity are usually associated with the country where the headquarters are located (Zekos, 2003).

When firms involved in GVCs decide to apply to authorities for dispute resolution, they might prefer their home markets as legislators have the motivation to capture more of the value in their jurisdiction. For instance, the home country might be interested in supporting large corporations that operate on other markets and bring cash flows to the country of origin in litigations (Avdasheva & Shastitko, 2012)

2.3 Specifics of Mobile Applications Suppliers' Contractual Controls in Digital Platforms

2.3.1 Contractual Controls in Digital Platforms

Digital platforms and ecosystems set specific rules that help manage membership and participant relationships (Jacobides et al., 2018). Platforms set terms and institutions that manage and facilitate marketplace functioning and relations between the business network participants. For example, platforms can regulate how the suppliers of products and services can show their goods on a marketplace. Moreover, platforms can decide "the data and APIs they [participants] can access, setting upgrading systems, regulating access to information that is generated on the platform, imposing minimum standards for delivery and return policies, providing for model contracts, imposing price controls". Regulation of this type affects market structure and competition (Crémer et al., 2019).

Digital platforms may choose different types of ecosystem governance, particularly either setting strict rules or managing the process flexibly. This influences whether network effects or quality effects enhance the platform's overall performance (Yi et al., 2019). In the case of applications and OS platforms, there is an unidirectional unique complementarity between the participants. Applications will not work without OS, and supermodular complementarity as the value and usage of OS increases with the number of available apps. Ecosystems can coordinate participants with standards and requirements to produce complex

interdependent goods or services but still allow complementors to decide on design and prices. Thus, ecosystems do not require exclusively hierarchical governance (Jacobides et al., 2018).

Governance of the digital ecosystem is usually a prerogative of a lead firm. However, sometimes an o rchestrator also shares some governance functions with other network participants (Nambisan et al., 2019). Control of participants' access to the main or crucial technologies is one of the main goals of contracts in ecosystems (Cennamo, 2016). Digital platforms and ecosystems coordinate multilateral dependencies of participants through sets of roles that have similar rights and obligations. Thus, an orchestrating firm can prefer not to enter into customized contracts with each partner. Most of them can be generic (Jacobides et al., 2018).

In platform ecosystems where platforms intermediate the cooperation of participants from different sides, a governance system might be hard to adopt, and it might be a constraint to an effective matching mechanism (Tiwana, 2013). If the governance is ineffective, the quality of the services presented on the platform might deteriorate (Hagiu & Spulber, 2013).

Application developers and other content creators distribute their goods and services on a digital platform to get more value (Wang & Miller, 2019). Platforms are characterized by network effects, substantial economies of scale, economies of scope thanks to data collection, marginal costs close to zero, significantly lower distribution costs compared to traditional firms, and a global reach that helps to increase sale volumes (Elberse, 2008; Hagiu & Wright, 2014).

When entering a platform, suppliers sign several agreements. A platform imposes complementors on the terms of trade, quality levels, and provided services. Some participants might see it as unfair if a platform owner explicitly tries to increase its share in value distribution. The situation worsens when large digital platforms that collect information about sales, price, packaging, and other data of the complementors in real-time. Then a platform might exploit such information in their interest, for example, by entering the complementor's market (Committee for the Study of Digital Platforms. Market Structure and Antitrust Subcommittee, 2019).

2.3.2 Possible Means of Reducing Contractual Controls in Digital Platforms

The bargaining power of a strong participant in contractual negotiations affects the exclusivity and contingency of a signed agreement. A powerful supplier may prefer an exclusive contract with a downstream firm to guarantee the most favorable outcomes. In digital platforms, a leading downstream firm usually possesses more power (Bacchiega et al., 2016). Among other participants, complementors that attract more valuable resources have greater bargaining power in negotiations (Pfeffer & Salancik, 1978; Collis and Montgomery, 1998). For instance, in the research by Wang and Miller (2019), large book publishers with "rights to many valuable books have a stronger bargaining position than small publishers".

To reduce contractual pressure, GVC members can:

1. Rely on their own resources in negotiations: strengthen alternative distribution channels (Wang & Miller, 2019) or withhold high-demand product offering from a platform (Wang & Miller, 2019).

2. Unite with other participants to act collectively. This effect can be achieved by intensified pressure as a larger group and improved persuasiveness with consensus between ex-competitors (Nakanishi, 2020).
3. Lobby lawmakers and regulators to change existing legal and regulatory frameworks and enforcement practices in the company's own interests and influence the legal status of a platform owner.
4. File complaints to state organizations based on existing rules to advance their interests. Possibly, a value chain participant can go to authorities to protect itself and strengthen its position in negotiations.

As mentioned, one of the means for a network participant to increase their bargaining power when dealing with a strong counterpart is to cooperate with other participants against a lead firm (Nakanishi, 2020).

The second means arises from a network specificity of platforms. Downstream firms, which are platform holders in case they distribute final goods and services, in markets with a higher degree of concentration are more capable of value appropriation (MacDonald & Ryall, 2004). A platform contributor might face a problem that, due to network effects and economies of scale, the development of relations with a platform fosters the bargaining power of a platform holder. Consequently, this leads to a reduction of the value share a complementor can get. Platform suppliers have incentives to join a platform to benefit from their network effects, which is also ultimately beneficial for other platform participants. However, value creation and value appropriation processes might lead to conflicts in the relations between different sides. By distributing a greater amount of their content through a digital platform, content suppliers help the platform attract more users that value diversity and quality of offerings. In turn, a growing userbase makes the platform more attractive to the platform contributors (Wang & Miller, 2019).

Platform participants might strengthen their bargaining position by preserving and developing other partners and ecosystems. For instance, the Atari video game console crashed when opportunistic software developers refused to distribute their best games through the resources of Atari. They only supplied the console with low-quality games and distributed successful titles through other partners (Boudreau & Hagiu, 2009). Complementors to digital platforms are exposed to multiple risks when they enter a digital platform. For instance, the platform owner can replicate their most value-generating products and services and drive the competitor out of the market. Limitation of engagement and product offerings is a strategic mechanism for content suppliers to regulate and control their business interactions with platforms and other partners that exploit network effects. Complementors get less revenue for their high-demand offering but at the same time, they limit the platform's ability to appropriate value and power (Wang & Miller, 2019).

Another option is for the platform participants to lobby lawmakers to change the existing legal framework in their interest. In doing so, the platform participants likely have to compete with the conflicting lobbying efforts of platform owners. Mediating between the pressures of these interest groups, governments can indeed reshape the interaction between platform owners and participants, for example, by setting terms and conditions for online platforms after multiple complaints from small players. For example, according to Shead (2020), in the European Union (EU) many application developers are supporting the development and

welcomed drafts of Regulation (EU) 2019/1150 (so-called Platform-to-Business Regulation). The new regulation imposes rules for the operations of digital platforms.

Platform rules for participants then (Mitsios, 2019):

1. Have to be drafted in plain and intelligible language.
2. Cannot be changed without advance notice of at least 15 days.
3. Need to exhaustively spell out any reasons that could lead to the delisting of a business user.
4. Have to list the main parameters that determine the ranking of search results.
5. Have to include information about any ways in which a platform that sells on its own marketplace might give preferential treatment to its own goods or services.
6. Have to be clear about the data policy of the platform – what data it collects, whether and how it shares the data, and with whom.

In case of issues, business participants also have other reaction tools:

1. Platforms have to immediately provide business users with a statement of reasons when they delist their goods or services.
2. They need to provide an effective and easily accessible complaints handling mechanism, challenge delisting.
3. They need to engage in good faith in any mediation attempts.
4. Organizations representing business users have the right to take actions before national EU courts to stop or prohibit non-compliance with the Regulation.

Another possible option is to exploit the resources of authorities when a lead firm in a platform abuses its market power. One of the available tools that companies possess is addressing complaints to antitrust authorities to limit the anticompetitive practices and controls imposed by a strong player.

2.3.3 Competition Law as a Mean of Reducing Contractual Controls in Digital Platforms

Complementors of digital platforms might seek the help of authorities to strengthen their weak position in dealing with a lead firm. In most jurisdictions, platform and digital ecosystem regulations are not completely developed and defined. The regulations' incompleteness arises out of the specificities and peculiarities of platform ecosystems as a new model of market functioning. Nevertheless, the situation is changing. In several jurisdictions, there are movements in legislation to change the current status quo and tackle digital platform dominance.

For instance, in Russia, the regulation of digital platforms is developing based on competition considerations. The Federal Antitrust Service (FAS) proposed several amendments to the Law on Protection of Competition, known as the fifth antitrust package. If approved, such amendments will extend antitrust regulation to the digital industry and create a legislative framework for digital platforms. New criteria of market dominance will be the ownership of the special infrastructure, presence of network effects, 35% or larger market share for interchangeable transaction support services (Draft of “The Fifth Anti-Monopoly Package”: Highlights, 2020). Infrastructure refers to the platform that is used to conclude deals between

buyers and sellers. And the "network effect" is the receipt of economic benefits from the number of users, including through the collection and processing of data (TASS, 2020). In case dominance is proven, the new Law will prohibit discrimination against clients, setting unjustifiably high monopolistic prices for the services (FAS Russia is preparing the fifth antimonopoly package of legislative initiatives against the dominance of digital giants, 2020).

The EU developed Regulation (EU) 2019/1150 (Platform-to-Business Regulation) that defines the borders in which the platforms can operate. Since December 2020, the European Commission also released a proposal for a regulation of the European Parliament and of the Council on contestable and fair markets in the digital sector COM/2020/842 final (so-called Digital Markets Act, DMA). Providing a framework for the regulation of digital services, the DMA will help users and small business players to protect their interests against gatekeepers' unfair conditions, fostering innovation and competition on digital markets (How Do Online Platforms Shape Our Lives and Businesses? - Brochure | Shaping Europe's Digital Future, 2021). The European Commission report, developed by Crémer, De Montjoye & Schweitzer (2019) argues that digital platform holders accumulate massive of large arrays of data which can provide them with a strong competitive advantage and low possibility of future platform substitution. Thus, dominant platforms must act with a high level of responsibility and not restrict competition on their platforms. Competition should be "fair, unbiased, and pro-users" to prevent users from defecting from the platform's ecosystem (Crémer et al., 2019). Khan (2016) proposes that digital platforms like Amazon should be treated as utilities or essential facilities from a regulatory point of view. It must be followed with extended use of predatory pricing rules for companies with a market share above 40% and more aggressive approach towards vertical integrations of huge digital companies.

Currently, until a specific platform regulation is developed, value chain participants have antitrust Law as an instrument to influence platform holders. They can trigger an antitrust investigation against other participants of the value chain by filing complaints to competition authorities. Competition law violations can consist either of anti-competitive agreements or abuses of dominant position. In particular, platform holders are suspected of engaging in abusive practices. Examples of abuses in platform ecosystems include a strong player using its dominant position to exclude rivals or charging excessive or predatory pricing for the services provided[1].

Competition between companies is needed for a lower price, better choice, better service, and innovation. Businesses must compete on the merits of their work fairly and within a set of rules. In case of market failures, competition mechanisms might, however, not work. This may lead to the concentration of power and resources in the hands of a small group of undertakings (oligopoly) or a single undertaking (monopoly) (Lemley & McKenna, 2012). Antitrust Law, according to Bork (1978), is designed to enhance economic efficiency, consumer welfare and the protect competition of market agents rather than competitors

[1] Among the recent cases are Spotify complaining that Apple App Store platform charges excessive fee (Reynolds, 2021), Fortnight's exclusion from Apple App Store and Google Play (Statt, 2020), Amazon low pricing for own production (Palmer, 2020)

themselves (Bork, 1978). Governments can intervene in market dynamics to correct market failures in the public interest (Lemley & McKenna, 2012). Antitrust investigations require careful and profound economic analysis. Otherwise, high rates of competition authorities' legal errors, both wrongful convictions, and wrongful acquittals, may diminish the deterrence effects of antitrust regulation (Avdasheva & Kryuchkova, 2015). Companies and individuals might initiate private or public antitrust enforcement. Their usage in competition law differs in the countries (OECD, 2021).

Competition law in developed markets, such as the European Union, mainly focuses on protecting competition terms and consumers in domestic markets. GVC lead firms' operations and their desire to limit competition outside national borders are weakly regulated (Davis et al., 2018). Antitrust regulation of companies with cross-border operations, such as, for instance, many digital platforms, is a complicated economic and legal question. The cooperation of antitrust regulators from different countries might strengthen aggregated public abilities against monopolies. First of all, decisions made by competition authorities in one country then become known in other markets. Secondly, the probability of infringement detection increases and monopolies can lose their incremental revenues in many regions while serious sanctions are significant only in several big markets. Thirdly, the sum of sanctions imposed on a monopolist by national antitrust regulators in several regions can be bigger than the expected benefits from their violation (Avdasheva & Shastitko, 2012).

National legislative frameworks are most commonly applied due to the highest level of possible antitrust enforcement. National competition authorities possess intellectual resources, enforcement instruments, and power to apply sanctions. Moreover, national antitrust authorities consider national interests and sovereignty reinforced by strong entities in different economic and political spheres of their countries and thus do not support creation of supra-state, international regulators (Avdasheva & Shastitko, 2012). However, supranational organizations and agencies can make recommendations to national regulators (e.g., WTO) (Avdasheva & Shastitko, 2012).

Current views on antitrust regulation differ across the countries. EU competition law applies only to business activities that have the potential to affect trade between member states. EU and national competition authorities of member states can enforce Treaty on the Functioning of the European Union (TFEU) provisions. An important peculiarity is that the European Commission combines supranational and national antitrust policies. Member states are obliged to harmonize their internal competition laws with the requirements of the common European ones. Nevertheless, the spheres of competence of national and supranational authorities are delimited (Avdasheva & Shastitko, 2012). The EU antitrust regulation practice, that protects the market from the "dominance" of powerful players, "allows for structural remedies to address monopolization only when there is no equally effective behavioral remedy or where a behavioral remedy would be more burdensome" (Council Regulation (EC) No 1/2003 of 16 December 2002 on the Implementation of the Rules on Competition Laid down in Articles 81 and 82 of the Treaty, 2002). European Parliament research highlights that "competition authorities and policymakers should focus on

preventing the creation of entry barriers, facilitate entry into markets, and foster innovation, … have a cautious attitude towards actual competition problems and rely on the self-correcting powers of the market…" (Van Gorp & Batura, 2015). EU competition laws are enforced by the EU Commission through the Directorate-General for Competition (DGComp) (European Commission - Competition, 2021). Interested parties may challenge DGComp's decisions before the EU Court of Justice (EUCJ), which interprets antitrust rules to harmonize their application in the EU member states (Court of Justice of the European Union, 2021). The core legal sources defining competition regulation in the EU are articles 101 and 102 TFEU. The EU discipline generally focuses on abuse of power by a dominant enterprise but Merger Control Regulation can prohibit mergers above certain turnover thresholds that create or strengthen the dominant position of a firm on a relevant market (Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings – 'The EC Merger Regulation').

In particular, to assess whether a company has committed an abuse of dominant position under Article 102 TFEU, a competition authority must first assess whether such company is dominant in the relevant market. The competition authority must then first identify the relevant market, which consists of a product and geographical market. According to the EU Commission, "a relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer by reason of the products' characteristics, their prices and their intended use" plus "a relevant geographic market comprises the area in which the firms concerned are involved in the supply of products or services and in which the conditions of competition are sufficiently homogeneous". In practice, the relevant market is identified using the Herfindahl–Hirschman Index or Small but Significant and Non-transitory Increase in Price test («SSNIP») (Lemley & McKenna, 2012). Once the relevant market has been identified, the competition authority must assess whether the company holds a dominant position in it. A company is usually considered dominant if its market share exceeds 40%. A dominant company can use its market power to act independently of effective competition pressure. This means that the dominant company, for instance, may impose prices above the competitive level or limit the quantity, quality, and innovation of goods and services below the competitive level. Article 102 TFEU targets not only these conducts but also all instances in which the dominant company restricts or threatens to restrict competition in the relevant market. Thus, in the final stage, competition authorities assess the actual and potential anticompetitive effects of the conduct. If conduct also has pro-competitive effects and procompetitive effects outweigh its anticompetitive effects, the conduct may however be lawful (European Commission, 2009). Recent cases regarding Art. 102 TFEU include Qualcomm – predatory pricing (Case AT.39711), Orange Polska S.A. - limiting access to its network (Case T-486/11), Intel – loyalty rebates (Case C-413/14 P)

Consequently, in the EU the abuse of the dominant position test looks like this:

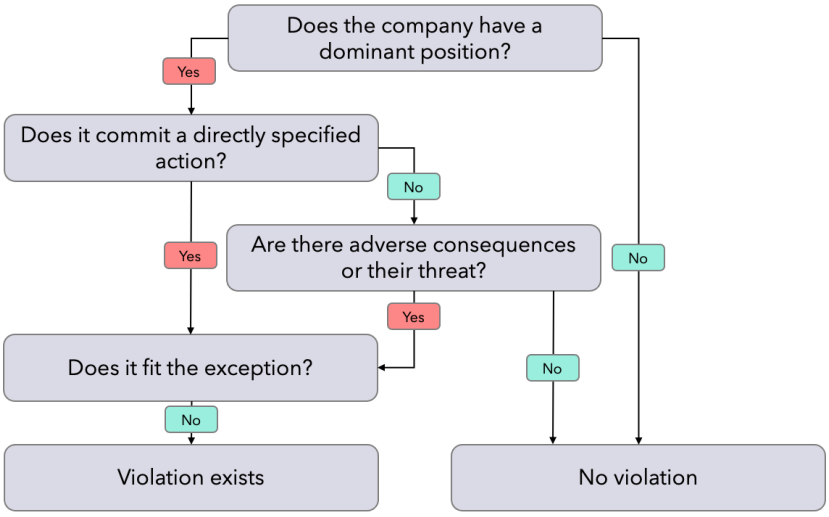
1. Identification of relevant market (product and geographical).
2. Assessment of dominance via market shares.
3. Assessment of actual and/or potential anticompetitive effects of the conduct.

In Russia, The State Duma of the Russian Federation develops and adopts a legal framework for antimonopoly legislation, after which the laws must be approved by the Council of the Federation (Rossiyskaya Gazeta, 2006). Federal Antimonopoly Service (FAS) exercises control and supervision over the observance of the legislation in the field of competition in the commodity and financial markets. FAS's main competencies are (Public Services and Supervisory Functions, 2021):

1. To review cases on violations of the antimonopoly legislation of the Russian Federation.
2. To inspection compliance with the requirements of antimonopoly legislation.
3. To establish the dominant position of economic entities.
4. To perform other functions of executive authority.

According to the Russian Federal Law of July 26, 2006, N 135-FZ (as amended on February 17, 2021) "On Protection of Competition" (Federal Law of 26.07.2006 N 135-FZ (Ed. From 17.02.2021) "On Protection of Competition," 2006) and Clarification of the FAS Russia N15 "On a prosecution for abuse of the dominant position of economic entities recognized as collectively dominant" (Clarification of the FAS Russia N 15 "On Bringing to Responsibility for the Abuse of the Dominant Position of Economic Entities Recognized by Collectively Dominant" (Approved the Protocol of the Presidium of the FAS Russia of October 24, 2018 N, 11), 2018), a simplified scheme for antitrust investigation in Russia can be illustrated the following way (Picture 1.2):

1. Does the company have a dominant position?
2. Does it commit a directly specified action?
3. Are there adverse consequences on competition or their threat?
4. Does it fit the exception (procompetitive effects outweighing anticompetitive effects)?



Picture 1.2 Simplified process of investigation of a violation of the Law on "Protection of Competition" (Federal Law of 26.07.2006 N 135-FZ (Ed. From 17.02.2021) "On Protection of Competition," 2006)

Remedies and sanctions used by national authorities against monopolies vary across countries. In the Russian Federation, penalties can be of civil, administrative, and criminal nature, while in the EU, only civil and administrative. The EU antitrust system basically aims to the protection of common market and

instrumentally relies on public enforcement. According to Regulation 1/2003, it allows high financial penalties that can reach 10% of the firm's turnover.

Generally, instruments used by authorities are (Cavanagh, 2005; Melamed, 2009):

1. Behavioral – e.g. monopolies are obliged to stop anti-competitive actions, change contract terms;
2. Structural – aimed to modify the structure of the market, product by separation of the company, unbundling of goods;
3. Damage compensation – e.g. when victims sue monopoly;
4. Administrative fines;
5. Criminal sanctions – in the jurisdictions where it is allowed;
6. «Gibbet» fine - social consequences and the further response of the financial markets.

Thus, "weak" participants can seek the help of authorities in changing the contractual controls imposed by dominant market players that worsen their operating conditions.

There are different opinions on how market monopolization influences innovation. J. Schumpeter stated that «perfect competition is inferior in internal, especially technological, efficiency. Monopoly, in contrast, affords protection against temporary disorganization of the market and secures space for long-range planning». Arrow, on the contrary, points out that «the incentive to invent is less under monopolistic than under competitive conditions.». The World Intellectual Property Organization (WIPO) position is that "experience shows that too high or too low protection of both patents and competition may lead to trade distortions" (Competition and Patents, 2021). There might be a possible positive influence of dominant platforms on R&D and trade intensity, which are crucial parts of the globalized digital economy. Competition authorities in their investigations must consider the best market design to foster innovation and still protect competition for the benefit of consumers. Furthermore, digital platforms perform on the markets with high fixed costs, while it costs nearly nothing to produce additional goods and marginal costs are nearly 0 (Competition and Patents, 2021). Competition authorities need to investigate all sides of a market before deciding that some practice of a platform is particularly harmful for competition. Regulators must take into consideration if some of the participants are provided with services for free, some services are subsidized, and the general welfare of the network increases. These conditions can be justifying even if some sides are affected by product tying, exclusive agreements, pricing below marginal cost, negative pricing (Kennedy, 2020).

The hardest part for the authorities is arguably the identification of the relevant market and the possible monopolist's market share. According to Stigler (2019), the market "varies according to what consumers are substituting between". For digital platforms, competition can be viewed as rivalry between complements, between different platforms, or a platform and potential future competitors in emerging markets. Competitive authorities must identify the specific anticompetitive exclusionary or exploitative conduct, but on digital markets, there is a vast number of possible conducts (Committee for the Study of Digital Platforms. Market Structure and Antitrust Subcommittee, 2019). Elena Zaeva, Head of the

Directorate for Regulation of Communications and Information Technologies of the FAS Russia, suggests that for the experts of the Russian Federal Antimonopoly Service it is challenging to determine the boundaries of the digital product market with the means of existing antitrust tests as the digital market boundaries constantly change. In general, the approaches to conventional markets apply to digital ones, with the notation that many products are "free". Services are offered for data about consumers and their behavior. According to the way platforms influence legal relations, they can be divided into transactional, in which goods are offered, and purely digital relations (Association of Antitrust Experts, 2021). Victor Topadze, "Avito" 's Legal Director, states that to understand a digital company's market share, a researcher must evaluate multiple criteria, such as active users, time of use of platforms, and multihoming. Moreover, antitrust investigators must assess market power as the ability to influence adjacent markets and restrict market access by setting entry barriers for other players (Association of Antitrust Experts, 2021).

All in all, the regulatory and competition law framework may be improved to better account for the peculiarities of the platform ecosystem compared to traditional industries. However, digital enterprises now often become a target of antitrust investigations under the existing legal framework because of their market power. Digital platform complementors have incentives to attract authorities when their interests are abused by platform holders' contract conditions. This is one possible means to support their bargaining position in negotiations with a powerful network o rchestrator.

Procedures, penalties, and enforcement power of competition authorities vary across the countries, which means that international companies can possibly choose where to file a complaint. Competition authorities' decisions can strengthen suppliers' position in the network on an individual level, affect a GVC or lead to global shifts in the industry and cross-border operations. This is a direct consequence of the deterrent effect of competition law sanctions. This deterrent effect is both specific and general. Specific deterrence means that an established competition law precedent helps weaker sides deter a stronger side from continuing to commit a specific violation or committing the same violation again (because sanctions will apply). Conversely, general deterrence means that a precedent may also deter other stronger parties from engaging in conducts similar to those already sanctioned. This is because the regulators will possibly treat similar violations alike and follow the precedent. A competition law precedent is indeed a 'lesson' not only for the companies directly involved but also for the market at large. Recent amendments in local legislation show the importance of platforms' regulation issues and their understanding by regulators around the world. To evaluate the effectiveness of filing a complaint to local competition authorities against a platform by mobile application suppliers, qualitative and quantitative methods will be used in the second part of the paper. This will allow us to establish dependencies and develop further managerial recommendations.

The main tested hypothesis in the work are:

1. Platform owners capture a large share of the value in a mobile apps global value chain;

2. Preferrable strategy of mobile app developers is to enter a global digital platform with contractual controls instead of not entering a market at all;
3. Mobile apps suppliers can reduce contractual controls of platforms-monopolists by complaining to competition authorities in various geographies.
4. When deciding which local competition authorities to attract, companies tend to file complaints in their home regions.

3. ANALYTICAL PART

This part of the work provides a review of mobile application industry. The section includes qualitative research of possible means to increase app developers bargaining power with platforms. A questionnaire for industry management, an interview and two case studies help to test the hypothesis formulated in the previous part. Qualitative research includes calculations of platform's losses on commission and building a formalized model of developers' decision to work with a digital platform.

3.1 GVC of Mobile Applications: Participants, Captured Value

3.1.1 Mobile Applications Value Chain Participants

Mobile applications are software developed and produced for mobile devices to perform specific tasks of users (Amalfitano et al., 2013). Mobile software is mainly distributed through special application stores, such as Apple App Store for devices that run on iOS operation system and Google Play for Android devices. Application stores are platforms that connect application developers with mobile devices users. They are multisided markets with millions of listed programs and billions of downloads generates by mobile devices' users (App Store vs Google Play: Stores in Numbers - Masters Blog, 2018). Thus, third party developers produce complementary products for the mobile ecosystem and use platform resources to enter new markets, create value with their applications (Wen & Zhu, 2019). In turn, platform holders need a variety of applications suitable for their operating system (OS) available to increase total value of the system, keep the users satisfied with the choice, foster innovation.

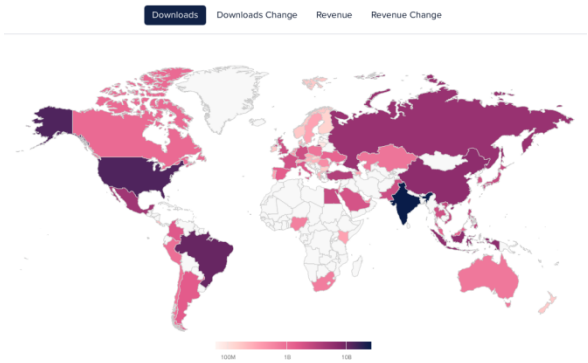
Mobile applications and platforms (application stores) are part of mobile ecosystems. Generally, mobile ecosystem is represented by the key parts (Höppner et al., 2019):

- Hardware - a physical device that can run software (e.g., iPhone 11, Samsung Galaxy S10);
- Operation system - software that allows to install and run other software, enables basic functions for user to interact with a device (e.g., iOS, Android).
- Application Store - a platform for software distribution where users access additional applications to customize devices to their needs (e.g., Apple App Store, Google Play).
- Applications - software to perform specific tasks on mobile devices developed by platform owner or independent developers (e.g., application for music streaming service Spotify, Fortnight game).
- User - owner of a smart mobile device, who downloads apps and uses them.

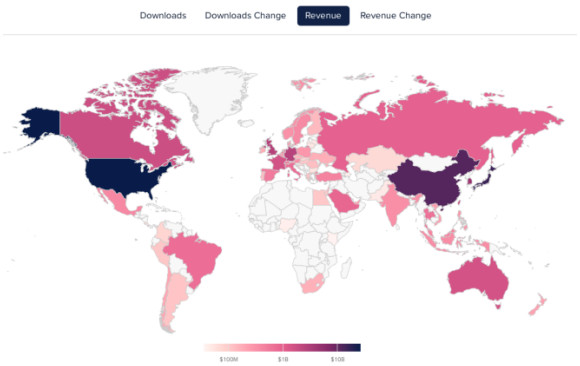
Mobile applications ecosystem and value chain with interrelation between the participants in a simplified scheme looks the following way ((Picture 3.1):

Picture 3.1 Mobile applications ecosystem and value chain (Höppner et al., 2019)

Application producers are located in different states: for instance, top applications by revenue and downloads were developed in the US, France, Russia, China (Appendix 1, 2) (Chapple, 2021). Through digital platforms, app producers are able to supply their software to the global users (Peltonen et al., 2018). By estimations of App Annie, one of the leading mobile market data platforms, most mobile application downloads are generated by users from India, the United States, and Brazil (Picture 3.2 and Appendix 3). Software developers receive the biggest share of their revenues from the United States and China users (Picture 3.3 and Appendix 3) (App Annie, 2021).



Picture 3.2 Mobile applications downloads by country. iOS and Android. June 2020 – May 2021 (App Annie, 2021)

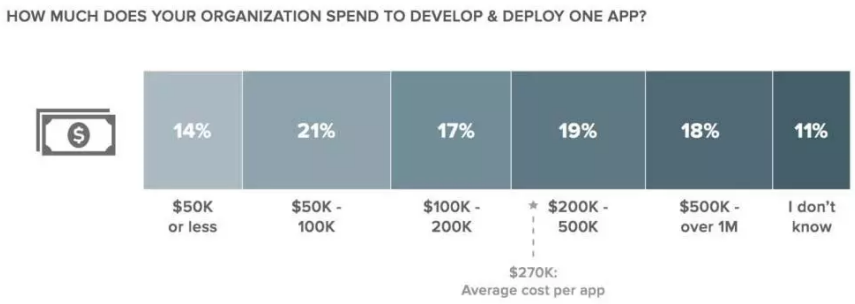


Picture 3.3 Mobile applications revenue by country. iOS and Android. June 2020 – May 2021 (App Annie, 2021)

Application stores are platform marketplaces that allow users to download, install, manage applications available for the operating system through one interface. App Store owner opens access to the platform to independent software developers to create a greater supply of applications available for the device users. Thus, it benefits from the indirect network effects. In the case of Apple, the more is the supply of applications on Apple App Store, the more users decide to choose iPhones. Vice versa, with the growing popularity of iOS devices, Apple App Store platform becomes more attractive for software developers. For Apple devices, the Apple App Store is generally the only legal way for users to install software on their smartphones (Höppner et al., 2019). For Android devices, there might be alternative application stores, but

their popularity and the number of available applications to download cannot be compared. For example, Amazon App store, the second-largest app store for Android, offers five times less applications in 2020 in comparison to Google Play (App Stores List (2020), 2021).

At a closer look, in the value creation process software developers have significant initial costs on research and development. Expenditures vary across the world with hourly app development rates from $8 in India to $225 in the US per hour (Matyunina, 2020). For an average application, R&D costs range from $3,000 for a simple app to $1,000,000 for a complicated app (Augustin, 2015) and constitute around 35% of final costs during the first 2 years of the application's life (Hamblen, 2012). Kinvey report provided an approximation that on average it costs $270,000 to develop an app (Blair, 2017).



Picture 3.4 Mobile applications development costs, Kinvey CIO (Chief Information Officer) survey (Blair, 2017)

Development of an app typically takes around 5 months from initiation of the process to the app's launch. To produce a minimum viable product (MVP) developers need several months to complete the following stages (Humphrey, 2018):

1. Research and planning (differs across app categories);
2. Deciding on functions and features (~1 month);
3. Technical feasibility, design, and development (~1-2 months);
4. Testing and refinement (~1 month).

After the application is ready and published, marketing and maintenance costs start to take a significant share of resources. Maintenance and support on average take from 20% (Blair, 2017) to up to 50% (Blair, 2018) of total development costs yearly. Marketing costs include market research, user acquisition, App Store Optimization (ASO), social media (SMM), and pubic relations (PR) outreach and constitute at least $10,000 per month with continuously growing advertising spend on user acquisition (AppsFlyer Predicts Global App Install Ad Spend Projected to Reach $118B by 2022, 2020).

On a revenue side, launched applications on a platform can be offered as (Google AdMob, 2018):

- Free for download:
    - Without monetization;
    - With subsequent monetization through ads;
    - With subsequent monetization through sponsorships (incentivized ads);
    - With in-app purchases of digital goods (e.g., in-app currency, features);

- With in-app purchases of physical goods;
- With a subscription for extended functionality;

- Paid for download.

This research focuses on applications that have paid content (in-app purchases, subscription) and monetized with the means of platform transaction systems. Platform owners charge a fixed revenue share from each transaction as a distribution fee. Apple charges a 30% commission when device owners download paid apps and make in-app purchases of digital content, services, and subscriptions, leaving developers with 70% of revenue. For in-app subscriptions, Apple charges a 30% commission for the first year, and Apple's commission falls to 15% starting from the second year (Kwan, 2020). App Store "tax" was set at the level of 30% in 2008 and then became an industry standard (Morrison, 2020). From 2021 the size of commission decreased to 15% for all the developers who earn less than $1 million a year under the pressure of the public (Leswing, 2020). Sensor Tower platform estimates that around 98% of Apple AppStore publishers will benefit, however, their revenue is only 5% of total in-app payments on Apple's platform (Nicas, 2020).

Table 1: Commission Rates for Select App Stores

Google Play Store	▪ 30% (15% for subscriptions after 12 months)
Amazon Appstore	▪ 30% (20% for video streaming subscriptions)
Samsung Galaxy Store	▪ 30% (or otherwise agreed-upon)
Microsoft Store	▪ 30% on games ▪ 30% on all sales in Business and Education stores ▪ 30% for Windows 8 devices ▪ 15% otherwise
Apple App Store	▪ 30% (15% for subscriptions after 12 months)

Image: Apple

Picture 3.5 Commission rates for developers in different Application Stores (Borck et al., 2020)

Sides of the mobile apps value chain participating in creation and capturing value might get uneven income in comparison to their efforts. Platforms take a significant share of revenue for the marketplace provision and payments processing, leaving some producers with no profit. According to the report produced by Analysis Group for Apple, video games producers and publishers receive 70% of sales with a 30% fee going to digital marketplaces. Other software developers working through application stores receive 70-85% of revenue after marketplace commission. Revenue, remaining with the developers is more than if software was distributed through brick-and-mortar shops with typical distributors' and retailers' margins consuming 55-70% of sales (Borck et al., 2020). However, 15-30% commission of platforms is charged for marketplace maintenance and payments processing, while other payment systems typically get a 2-3% fee for intermediary service functions (Rey, 2020).

3.1.2 Application Stores as Platforms with Abuse of Market Dominance

Digital platforms in the smart devices industry list applications from multiple independent publishers and connect users with digital goods, acquiring and processing all the transactions. Digital platforms have a unique position on the market: they provide other companies with tools to develop, supply, and promote their services (Gilbert, 2020). Tech giant companies such as Apple, Google, Amazon own platforms which

give them huge power, financial and non-financial benefits. They collect and use massive consumer data, acquire competitors and control which independent businesses, and producers can access their app ecosystem. Platforms are regularly discussed by authorities and the public because of privacy concerns, issues with content moderation, including consumer data, access to the platforms by competitors. One of the general claims is that tech giants favor of own products and services (Schlesinger et al., 2019).

App store owners act as gatekeepers of their ecosystems. Every application has to get a platform owner's permission to be listed on the marketplace. For this, platforms claim compliance with the quality control guidelines which app stores check during an "app review" process for mobile app stores. If an app is recognized as low quality, it can be rejected or removed from the store (App Store vs Google Play: Stores in Numbers - Masters Blog, 2018).

Digital platforms can act both as platform owners and participants in the mobile apps market and sometimes overuse excessive power they possess. They can:

- Exclude or create unbearable conditions for competitors in the same app category by limiting access to the platform.
- Create the conditions when fair business negotiations are impossible and could be described as "take it or leave it".
- Infringe on patents of small competitors. The underlying logic is that market will be under their control by the time they have to pay up.
- Focus on monopoly rent over the best interest of other parties of the business, for instance, Basecamp search in Google was returning Google's app (Rey, 2020).
- Discriminate downstream competitors: rise fees for them, decrease the quality of service provided.
- Use collected data to imitate rivals' products, promote proprietary brands (Gilbert, 2020).

Possibly, mobile application stores such as Apple App Store can fit various theories of harm. They include exclusionary (Leveraging, Self-preferencing, Refusal to deal, Margin squeeze, Discrimination) and exploitative practices (Excessive pricing, Unfair trading conditions) (Höppner et al., 2019). Gilbert (2020) writes that "platform vertical integration can create incentives for the platforms to harm rivals if sales of their proprietary products become a large share of total revenues, if they can choose price structures that discriminate against rival products, or if they can engage in other conduct such as a refusal to sell rival products" as it happened when Apple banned Epic Games.

Further, Apple App Store is reviewed in more detail as a digital platform. Apple owns the whole vertically integrated digital ecosystem (Höppner et al., 2019):

- Hardware: smart mobile devices: iPhones, iPads, iPods; Apple's iOS has a 60% market share on the US market (Mobile Operating System Market Share United States of America, 2020) and over 30% on the Europe (Mobile Operating System Market Share Europe, 2020) among smartphones users;
- Key software: smart mobile operation system iOS.
- App store: Apple App Store;

- Applications: e.g., Apple Music.

Apple App Store is a distribution channel where developers can offer their software and monetize it. A large number of independent developers, that by some reports achieved 28 million of members (Kelion, 2020). They create apps that fit technical standards to run on iOS operating system and complement user experience on Apple devices. The digital platform provides iOS users with basically the only way to access applications of 3rd party developers. The only exclusion is a "jailbreak" - artificial modification of core software of the smartphone which allows installation of unauthorized software on the device (Höppner et al., 2019).

Apple has control over the provision of mobile applications on the devices produced by Apple and thus a dominant position on a downstream market (Höppner et al., 2019). Tim Cook, Apple's CEO, agreed that Apple decides which applications will be published on the Apple App Store alone, but stated that the App Store should be seen as a "feature of the iPhone, much like the Camera" (Perez, 2020). To substitute the services of the Apple App Store, consumers need to bear substantial switching costs, shifting to another mobile ecosystem with another OS (Android, for example).

As an exclusive payment processor on the Apple App Store, Apple, in a standard case, charges developers with a 30% commission on every in-app purchase and 15% for the subscriptions starting from the 2nd year (Perez, 2020). Co-Founder and chief technical officer (CTO) of Basecamp service David Heinemeier Hansson pointed out that platforms that play as market participants get an advantage against independent applications as it avoids a mark-up charge. Moreover, other payment systems get 10-15 times smaller commissions for their intermediary service functions (Rey, 2020). Tim Cook, Apple's CEO, on the antitrust hearing, denied possibility that Apple App Store can increase commission above the current 30%. Cook explained that the commission had been stable since the beginning, plus platforms need to compete for developers. "There is a competition for developers, just like there's a competition for customers. Developers write their apps for Android or Windows or Xbox or PlayStation" (Perez, 2020).

Apple also explains the size of the high commission by the need to further develop and maintain the platform, guarantee the quality of services and apps distributed to iOS users and protect their privacy, give access to the platform tools for the developers (Rey, 2020). Tim Cook states that 84% of applications presented in Apple App Store pay no commissions to Apple. Only 16% pay fees due to in-app purchases and subscriptions – thus, they fund maintenance and development of the Apple App Store (Perez, 2020). Apple App Store also sets special rules for "reader" apps (audiobook apps, streaming services, news publications, and other competitive products). They have an option of forgoing in-app purchases If a user buys subscription to service on another platform or resource, it can be transferred to an iOS device which is not bringing revenues to Apple (Perez, 2020).

As a platform owner, Apple has a right to exclude apps that do not comply with its policies in terms of technical and visual standards or deviate from the rules of monetization set for all of the developers who get access to the Apple App Store (Kelion, 2020). For example, one of the cases is Epic Games that allowed

the iOS users of its Fortnite game to pay bypassing Apple's own in-app payment system. The app was removed from the App Store for the violation of the platform's conditions, as Apple claimed violations could lead to security issues. Epic Games representatives accused Apple of illegal tying asserting that Apple's in-app payment system is bundling two products (iOS and Apple App Store) together for anti-competitive gain (Fung, 2020).

Platforms have incentives to enter the supply side of their marketplace to get more revenue. This creates a conflict of interest as a platform keeper will commercially favor its own products (Höppner et al., 2019). Moreover, by becoming a platform keeper and a participant at the same time, tech giants can imitate rivals and suppress competition (Gilbert, 2020). The threat of entry of the platform owner on a market where its complementors operate is claimed to have an adverse effect on innovation and value creation of the 3rd party suppliers, strengthening the position of a leading firm. However, there is an opposite point of view that a dominant company can shape the direction of innovation. By this it can adjust the production of redundant applications that waste excess efforts and resources (Wen & Zhu, 2019).

Apple plays both as a platform owner and a platform participant. Apple's own apps get a competitive advantage in comparison with other developers. The platform does not charge them with a commission on sales which in a developers' cost structure is a mark-up to the price (Gilbert, 2020). Consequently, Apple can set lower prices and receive bigger profits. Moreover, Apple preinstalls only its own applications on iOS devices. These programs can be easily accessed by the users: Apple Music, Apple iCloud, and others. Direct competitors like Spotify, Dropbox get less visibility in comparison to the native apps and need to compete on unequal conditions with Apple's products (Thompson, 2020). Furthermore, The New York Times found out that Apple frequently responded to consumer searches in the Apple App Store for a type of app, such as "music" or "podcast", with a list of its own apps before it displayed any rival apps, and sometimes included Apple apps that had little relevance to the search query (Nicas & Collins, 2019).

Taking into consideration all the risks and benefits of entering the platform as a distribution channel for applications, software developers need to sign contractual agreements.

3.1.3 Contractual Controls Power in Negotiations with Application Stores

Platform owners set rules for all the participants of digital ecosystems (Yi et al., 2019). Application developers deciding to enter the Apple App Store to distribute their applications have to pass three steps and sign formal documents. The conditions in them are generally similar for all the app suppliers. Developers create the Apple App Store account, pay an annual registration fee (Create an Apple App Store Paid Applications Contract, 2021). When submitting an app to the Apple App Store, developers must enroll in the Apple Developer Program with a fixed yearly fee of $99. It gives access to publishing the apps worldwide and additional services like Test flight. Single subscription gives developers ability to publish an unlimited number of applications and updates (What's Included - Apple Developer Program, 2021). After that app suppliers accept many terms about Apple ID, developer's account, applications publishing. Agreements include Terms of Use and Privacy Policy, plus a Developer Program License Agreement with a Paid

Applications Agreement (App Store Connect Workflow, 2021). Apple developer agreement is signed with developers and APPLE INC (Agreements and Guidelines - Support - Apple Developer, 2021). Moreover, Apple has separate entities for each currency in Apple App Store (Apple Legal Entities, 2021).

Applications published on a platform must conform with Apple's guidelines that will be used to regulate the app. The list of requirements and guidelines is quite broad and includes (App Store Review Guidelines - Apple Developer, 2021):

1. Development Guidelines (e.g. UIKit, AppKit, App Extensions, iOS Data Storage)
2. Design Guidelines (Human Interface Guidelines)
3. Brand and Marketing Guidelines (e.g., Guidelines for Using Apple Trademarks and Copyrights)

An interview with a product manager of a global mobile software developer Kaspersy revealed that the activities that go in addition to core terms, like individual bonus programs, advertising, posting on the main page, can be customized for developers. In basic rules and terms, that are standardized for the developers, Apple contracts are similar for the developers for the ease of control of their compliance. Otherwise, it might be costly to control and support all the payments. If there are rare deviations, they are usually not disclosed publicly. Possibly, some powerful participants might have a privileged position on a platform. For example, it went public that Amazon received a special condition for its Amazon Prime Video app and paid a 15% fee instead of a 30% for the apps selling digital goods and services (Kelion, 2020).

Apple offers developers many rules and terms they have to comply with to distribute iOS applications via Apple App Store. In return, Apple as a platform owner (presumably, reluctantly) gives developers data it possesses about users. Third-party app suppliers cannot access buyer demographics, search history, emails, and, consequently, they have a very limited ability to communicate with their users bypassing the platform (Jarsulic, 2020).

Sometimes members of GVC want to change the status quo of control instruments set by a leading firm (Gibbon & Ponte, 2008). According to the experience of the interviewed manager, developers are usually provided with a convenient dispute resolution method and applicable law. It is written in the agreement under which a developer gives the store a license to distribute the application. For the license to be valid, the app supplier must specify the terms, territories, and other characteristics, so that later not to argue about where to sue and what to be guided by, the parties to the contract write about which law applies and which court is competent. A developer can try to lower its risks and use international law, collision bindings, to try to transfer some dispute to a convenient legal territory for itself. However, "forum shopping" is rare as a court for a legal dispute is agreed in the contract. Some legal disputes lie not in the private legal field, but in the public law, for example, when antitrust laws are violated. In this case, the developer may complain to the regulator. Then the regulator itself proceeds the complaint and may investigate the platform. This happened in the case of Kaspersky and Russian FAS.

3.2 Evaluation of Managerial Scenarios of Working with Digital Platforms

For the purposes of this research, a questionnaire for managers of the mobile applications industry was created, sent, and analyzed. The sample constituted of product and marketing managers, CEOs of international app publishers that distribute and monetize their mobile applications via the Apple App Store in the global market. The survey included questions (Appendix 4):

1. Reasons why developers decide to enter Apple App Store to distribute their applications.
2. Means to advocate their interests in negotiations with Apple.
3. Incentives (real or possible) to file a complaint to competition authorities.

All the participants answered that their decision to enter the platform was mostly motivated by a desire to increase income. Most also explained the decision by a purpose to increase userbase. Half of the respondents also wanted to enter new markets and support multi-homing features. Potential benefits of entering a platform are mostly evaluated in terms of revenue and profit increase, potential userbase growth.

When asked about the list of agreements signed with Apple, representatives of developers either mentioned only “Apple Developer Agreement (Policy)” or stated that Apple offers several documents to sign. Conclusively, the process is not very clear and straightforward as the list of the agreements was not clearly stated by any of the survey participants. Most of the managers in the sample answered that contractual terms with platforms cannot be modified by complementors, however, some state that the rule of fixed terms have exclusions: “It depends, you could negotiate special offers in case your app portfolio of apps has a dominating market share and very profitable for the platform”.

To advocate developers’ interests, survey participants suggested negotiating with Apple (“communicate with Apple via regional App Store managers or Apple Business Development managers”), unite into groups of developers (“joined efforts of several big companies” and “act as app developers’ groups”) or get support from the authorities (“just government regulations”). One of the managers mentioned the fact that his / her company encountered a conflict with a platform lying in a public law space due to “unpredictable changes of Digital platforms rules of app review” and applied to the authorities of the developer's home market.

In sum, developers have quite similar incentives to choose a digital platform as a means of app distribution. Multiple terms and conditions signed by Apple App Store complementors to enter the platform are often comprehended as a-priori and unmodified by suppliers in mobile applications GVC. Nevertheless, app developers named several ways to advocate their interests on a platform, and some of the survey participants even filed antitrust complaints against Apple. Hereby, we can identify several strategies for the work of mobile software developers with the platform that will be described in the next paragraphs.

3.2.1 Option 1: Do not Work with a Platform

There are various factors that can affect third-party supplier’s decision to stay in the market or leave it. The most obvious ones are profitability in the current and alternative markets where the company relocates business, the firm’s ability to adjust to changing environment, and switching costs of skills and

resources (De Figueiredo & Silverman, 2007; Menon & Yao, 2013). Several reasons can motivate application developers to go out of the platform or not to choose it as a distribution channel initially. For instance, insufficient resources to develop apps for multiple platforms, the excessive amount of fee imposed by the application store or platform's decision to become a supplier in the application's category.

Strong players have alternative ways to sell their digital products and can remove their applications from App Store or partly limit their functionality. Some application developers opted out from Apple's transaction processing services. It might be an alternative application store or service's own website. Netflix was generating nearly $900 million revenue through Apple App Store with more than $200 million commission share for Apple and used to be a top-grossing application on App Store. It decided to change the strategy at the end of 2018. Netflix tried to avoid Apple's fee and tested a new approach on several markets after which it made a decision to take away a function to register and subscribe to the service for Android and iOS users (Perez, 2018). "We no longer support iTunes as a method of payment for new members. Existing members who currently use iTunes as a method of payment can continue to do so. Apple is a valued partner with whom we work closely to deliver great entertainment to members around the world across a range of devices including the iPhone and Apple TV (Perez, 2018)". The majority of other developers have a single option to pay a fee to Apple if they want to have access to iOS users (Höppner et al., 2019).

Other examples of apps that limited their presence on a digital platform are:

1. Amazon. It has historically restricted movie and TV rentals and purchases to its own website or other "compatible" apps.
2. Kindle e-books. They are not offered for purchase in the Kindle mobile app.
3. Spotify also discontinued the option to pay for its Premium service using Apple's in-app payment system.

Epic Games with its Fortnight game managed to bypass Google's Play Store as it launched Android application as a sideloaded app. That decision resulted in Google's loss of $50 million+ in marketplaces fees (Perez, 2018).

To conclude, an app developer can exit or not enter a platform if it has:

- Strong brand;
- Substantial userbase;
- Technical infrastructure developed (e.g., payment system);
- Other platforms or supply channels;
- Resources for relocation of the business.

To formalize incentive not to distribute applications via platform, it should be more lucrative for an app than to try other scenarios in terms of economic profit:

Application LTV = $\sum_{i=1}^{n}$ Profit$_i$ = $\sum_{i=1}^{n}$(-(RnD Cost$_i$ + Maintenance Cost$_i$ + Marketing Cost$_i$ + Store Presence Cost$_i$) + Revenue$_i$ * (1-Store Commission$_i$) + Functionality of Multiplatform App + Technical Expertise + User Data)

i ∈(1; n) - where 'n' is a number of years when application gets revenue for digital content (e.g. in-app purchases, subscription).

In case the application decides not to operate on a platform initially, it bears no costs and receives no revenue. However, this strategy can have a negative effect on the overall welfare of a developer. Some users value multi-platform feature, the technical experience might be valuable for other developer's projects, while user data can be collected and analyzed for app improvement on other OS as well:

Profit = - (Functionality of Multiplatform App + Technical Expertise + User Data) ≤ 0

3.2.2 Option 2: Work with a Platform and Take the Contract Terms

A software company that works on a platform as the survey participants did, invests in R&D to meet the technical, design requirements of the platform. Platform participants can either comply with the rules and requirements of the Apple App Store or try to change the conditions in their interest.

If a company decides to operate in the given platform's conditions, it has to take into consideration that digital platforms in the tech industry charge complementors with a fixed fee and a fixed proportion of revenue generated (15-30%) (Yi et al., 2019). They can get their apps excluded from the platform any time after an app update or when a platform holder unilaterally changes terms and conditions. Plus, a platform has power, data, and resources to enter profitable complementors' markets. In this case, small firms-suppliers have nearly no ability to deter the entrance of an ecosystem owner (Wen & Zhu, 2019).

If a platform owner decides to enter a complementary market to extract more value or diversify the business, it has several strengths against third-party party competitors (Wen & Zhu, 2019):

1. As a platform owner it might be better technically as it has information about other rivals' products and can be perfectly technically compatible with the platform.
2. It can subsidize launched products on newly entered markets with other revenue-generating products while rivals can solely rely on one good they sell – adoption costs are low.
3. A platform owner can bundle new products with other services providing customers with no search costs and easy access to the features – thus consumers have no incentives to buy additional goods with the same functionality.

However, unlike usual competitors, platform owner should also care about the overall development and wealth of the marketplace it manages, taking into consideration that aggressive expansion can diminish the long-term prosperity of the ecosystem. It might stop being attractive to other market participants who will not invest in R&D to enter the platform expecting losses and instability (Wen & Zhu, 2019). In terms of consumer welfare, the platform's entry on app markets might be beneficial. Complementor's side is conditionally free-entrance, which might be socially inefficient (Berry & Waldfogel, 1999). New unlimited

market entrants of the already existing market, bring little additional value to the consumers. An o rchestrator that comes into the market should help other members allocate resources more effectively by reinvesting them in alternative areas (Wen & Zhu, 2019).

According to Wen and Zhu (2019), in case a platform enters a market, it is likely to conquer a significant market share in the segment. Thus, a new strong participant will decrease the value for the existing players. A platform member that expects a leading firm to enter its app market should consider changing the strategy of value creation and value capture, which are innovation and pricing (Wen & Zhu, 2019):

1. The firm might decide not to take any action until a leading firm enters the market. This is logical because the risks that the platform will decide not to enter are high. The complementor might bear huge costs on the reallocation of resources and reshaping production that would be sunk in case a platform holder finally decides not to enter (Goolsbee & Syverson, 2008).
2. Alternatively, a firm could start reacting when the risk of a platform owner coming in the market increases. By this the complementor can gain a competitive advantage in the early stage. In the affected areas it will rely on short-term profits, lowering innovation, and increasing price in the affected category. For instance, “app developers vulnerable to Google's entry threat reduce innovation on affected apps by 5.1% and increase these apps' prices by 1.8%”.
3. Independent developers that face entrance of a platform owner usually do not leave the market. It is expected that an applications developer will simply invest in innovation in unaffected by the leading firm areas: “when the entry is imminent, they shift innovation efforts to unaffected markets, manifested in a 4% increase in updates on existing apps and a 3% to 10% increase in the introduction of new apps.”
4. Developers with famous and lucrative applications fear entrance of the platform more: “they increase innovation by 7.8% for affected apps and 15% for unaffected apps”. Thus, popular applications invest more in their core area of app development even under the threat of a strong competitor’s entry.

Application LTV = $\sum_{i=1}^{n}$ Profit$_i$ = $\sum_{i=1}^{n}$(-(RnD Cost$_i$ + Maintenance Cost$_i$ + Marketing Cost$_i$ + Store Presence Cost$_i$) + Revenue$_i$ * (1-Store Commission$_i$) + Functionality of Multiplatform App + Technical Expertise + User Data)

i ∈(1; n) - where ‘n’ is a number of years when application gets revenue for digital content (e.g. in-app purchases, subscription).

In this scenario, the developer’s profit can be negative if some variable or fixed costs are too high, for instance, maintenance or marketing) while cashflow after the app store’s fee is low. The app store can affect ‘n’ by entering app’s market category or by rejecting the application.

3.2.3 Option 3: Work with a Platform, but Demand better Contract Conditions

Companies that distribute their mobile software via application stores might decide to strengthen their positions in their business relations with a platform. This might be a result of a participant encountering a conflict with a platform. For instance, some complementors are not willing to share a significant part of revenue with a platform holder like Apple.

App stores as platforms can decide what products to distribute through their resources. They can exclude not only direct rivals, but also other players that do not follow the tying rules imposed by ecosystem owner. For instance, Hey mailing app by Basecamp was blocked after the application update. A new version of the app did not have an in-app offer on Apple App Store but offered a $99 subscription on its website (Vaughan-Nichols, 2020). Nevertheless, Apple in its App Store Review Guidelines (3.1.3(b)) allows the transition of subscriptions from other devices for multiplatform services, but then the application must offer in-app purchases or subscriptions on iOS as well (Cipriani, 2020). Another case is Epic Games' "Fortnight" game was excluded from Apple App Store and Google Play for trying to avoid commission on payments through app stores (Paul & Sweney, 2020).

As investigated in the first part of the work and mentioned by the survey participants, value chain participants can reduce contractual controls of an o rchestrator using several strategies:

1. By joining a coalition of other participants for collective actions. For example, some mobile software developers created a Coalition for App Fairness (CAF) to protect 3rd party developers' interests and fight "against Apple's anti-competitive policies" (Coalition for App Fairness, 2021). Epic Games initiated a coalition that unites Spotify, Blix, Basecamp, Prepear, Deezer, and other app suppliers. The union is built around the idea of free competition in digital ecosystems, and three main complaints of the developers are:
    - 30% tax in Apple App Store
    - Anticompetitive behavior of Apple that makes software developers sell their content through the Apple App Store and can copy their ideas
    - Constrained choice for developers and users created by Apple (Spade, 2020).
2. By strengthening alternative distribution channels and diversify product portfolio. Companies with multi-homing strategies have more technical capabilities, development resources and can adapt to changes, shift innovation to other channels (Wen & Zhu, 2019). They focus on the apps that are not likely to be affected for a more stable position on the market in comparison to the apps only represented on one platform. Diversification of the strategy and entering several product markets, app categories, increases the sustainability of mobile software developers (Wen & Zhu, 2019).
3. By applying for the help of authorities. Developers can ask for help in dispute resolution to protect its interest and strengthen its position in negotiations. Also, they can try to lobby lawmakers and regulators to change existing legal frameworks and enforcement practices. Lobbying group FairSearch triggered an antitrust ruling against Google's anti-competitive practices in 2013 (Keizer, 2013). It led to a precedent

decision ruling of the European Commission charging Google with a €4.34 billion fine for actions that were recognized as limiting innovation of Android OS and preventing competition (European Commission, 2018).

Modern regulation of platforms is limited, and it is possible for developers to seek authorities' support in Competition Law due to the dominant position of a leading firm. In case of triggering antitrust investigations, a supplier can choose regulators from different regions:

1. Where most of the revenue is generated.
2. Home region of a company. Survey participants chose this option, describing that it is easier to file a complaint and get a positive decision of the regulator.
3. Home region of a platform. It is important to remember that, as it was described in the first part, judicial authorities are likely to support a big local player even if it conducts anticompetitive practices.
4. Authoritative region for other countries.

There are several publicly known antitrust cases initiated by application developers: Apple vs Kaspersky, Apple vs Spotify, Apple and Google vs Epic Games (Fortnight). In the situation with Fortnight, Apple and Google blocked Epic Game's game Fortnight from their platforms after the company tried to proceed with in-app payments itself bypassing mobile application stores and their 30% commission (Epic Games, 2021). The company filed complaints against the platforms in the US, Australia, EU, and the UK, claiming that the platform uses its dominant position to restrict competition (Barbaschow, 2020). According to Epic Games, this affects innovation, increases prices (with usual 30% commission for 3rd party applications with in-app payments), and limits application variety for the users (applications outside app stores are hard to find, download, and install) (Barbaschow, 2021). In its case against Apple, Epic needs to prove that Apple possesses market power, and the relevant market is excising Apple ecosystem, where people with iOS devices have only one option of app distribution. Moreover, Epic must prove that markets of app purchases and app payments are different and not a part of the same transaction. Otherwise, a harder justification of Apple's payment policies' anticompetitive nature will be demanded to win the case. If Epic wins the case, it will be a start for Apple's challenges in other regions as it will bring the attraction of other regulators to App Store position in the iOS apps' distribution. And this, consequently, might have an effect on the variety of applications iOS users can use and price competition by lowering 30% commission on in-app purchases (Lemley & Driscoll, 2021).

Application LTV = $\sum_{i=1}^{n}$ Profit_i = $\sum_{i=1}^{n}$(- (RnD Cost_i + Maintenance Cost_i + Marketing Cost_i + Store Presence Cost_i + Change of Contract Cost_i) + Revenue_i * (1-Store Commission_i) + Functionality of Multiplatform App + Technical Expertise + User Data)

$i \in (1; n)$ - where 'n' is a number of years when application gets revenue for digital content (e.g. in-app purchases, subscription).

In case when developer tries to change the terms of the platform's contractual controls, an additional 'Change of Contract' cost is added to the formula. It might include legal support, judicial costs, PR, and coordination of unions with other developers. If the efforts are successful, a developer can increase 'n' for itself, diminish Store Commission or enhance User Data parameter.

Two cases of the big international software developers triggering antitrust investigations against Apple will be researched. The first one is Kaspersky's Kaspersky Safe Kids app that was restricted in functionality in parallel with Apple itself entering the market category with its solution. The second is Spotify with its music streaming service competing with Apple's own Apple Music that is not charged with app store fees and gets other privileges from the parental Apple ecosystem.

3.3 Case Studies of Kaspersky and Spotify

3.3.1 Spotify Antitrust Complaint to the Russian Competition Authorities

Kaspersky is an international software developer and cybersecurity company that was established in 1997 in Russia. The company's headquarter office is located in Moscow with other 33 offices in 30 countries around the world (Company | Kaspersky, 2021). The company was the first Russian software company to be named on the list of the global software industry leaders: the company took 65th place in 2014 (PwC 2014).

Kaspersky's Parental control application Kaspersky Safe Kids (KSK) allows parents to control their children's devices, monitor their location, limit access to adult content. KSK is distributed as a separate app as well as a part of bundled digital security products of the developer (Kaspersky Safe Kids, 2021).

Over the years, Apple has been restricting and removing parental control applications from the Apple App Store platform. According to Sensor Tower, application data service, Apple put limitations and removed 11 out of 17 biggest apps in the category plus many other smaller software titles. Apple's spokesman claimed that parental control applications owners could access too much of the sensitive user data which creates an issue of security and privacy. Phil Schiller explained that Mobile Device Management (MDM) technology is intended for usage by corporations and company-owned devices to monitor user behavior on them: «there is risk that MDM profiles could be used as a technology for hacker attacks by assisting them in installing apps for malicious purposes on users' devices» (Slivka, 2019).

Kaspersky filed a complaint to FAS in March 2019. Antivirus developer claimed that the platform made it remove functionality of the Kaspersky Safe Kids application, for instance, app control and Safari browser blocking. It happened when Apple stepped into the parental control applications market with a built-in feature for iOS – Screen time feature, in September 2018 in parallel with the release of the iOS 12 operating system. Kaspersky claimed that Apple has a key capacity that allows it to enter new application markets, and attempts to renegotiate the situation with Apple were not successful (Cimpanu, 2019). In the press release, Kaspersky mentioned other parental control applications that lost their functionality and

decided to unite against the platform: Kidslox and AdGuard (Kaspersky's Antitrust Complaint against Apple in Russia, 2020).

After Kaspersky initiated private antitrust enforcement, Apple announced that it had improved a procedure for independent parental control developers to overpass App Store Review Guidelines. However, newly released on June 3, 2019 "Apple Developer Enterprise Program License Agreement" was pointing that parental control apps developers can use MDM profiles and their configurations only after a written agreement of Apple. MDM is essential for parental control applications, and Kaspersky's representatives refused to take back the complaint to FAS, explaining, explaining the decision with clear arguments (Kaspersky's Antitrust Complaint against Apple in Russia, 2020):

1. Apple did not allow independent developers unconditionally to use data available for Apple's own Screen time. Moreover, Apple did not set transparent rules of obtaining "explicit written consent to use MDM profiles and configuration profiles".
2. Apple reduced competitors' abilities to test their applications by banning 3rd party analytics.
3. Apple kept its right to vary App Store guidelines at any time, as well as to remove successfully reviewed applications from the store without preliminary discussion and explanation with the developers.

Kaspersky already had successful experience applying to a competition regulator. The company filed antitrust complaints against Microsoft in 2016 in the EU (European Commission and Germany's national competition regulator) and Russia. That time Kaspersky claimed that Microsoft made it difficult for independent antiviruses to comply with Windows own antivirus Defender after OS Window 10 update. Microsoft was disabling 3rd party antivirus vendors' software from Microsoft devices updated to a new version in order to promote usage of Microsoft's own antivirus Defender. Furthermore, Microsoft concealed notifications about license expiration of 3rd party antivirus software, automatically switching users to Defender after the end of the license. The OS owner limited the adaptation period for independent producers to 6 days while previously it was giving 2 months (Bindi, 2016). FAS opened an investigation of whether Microsoft was acting against Part 1 Article 10 of the Russian Federal Law "On Protection of Competition" (Federal Law No. 135-Fz Of July 26, 2006 On Protection of Competition). What is important, the developer dropped them as it managed to reach an agreement with the OS producer in August 2017. The companies simultaneously issued a resolution to their disputes on compatibility issues (Volz, 2017).

In the case with Apple, FAS opened an investigation of Apple's dominant market position abuse in August 2019 (Staff, 2019). Kaspersky manager in the interview claimed that the developer chose FAS as it is the home country regulator. Concerning the case Kaspersky vs Apple, regulator had to identify that Apple has a dominant position in the app distribution market. After that, FAS needed to find out abuse of dominance.

Firstly, the Russian Competition authority had to investigate the market position of Apple. FAS determined that there is a world market for the distribution of applications for mobile devices operating under the operating system iOS. In this market, Apple's share will be close to 100%, as there are no official

alternative channels for installing applications. Testflight, PWA, IPA Sideloading work without jailbreak. They can be considered as alternative channels of iOS apps distribution, but the survey of users and developers revealed that the actual share of these channels is minimal (Federal Antimonopoly Service of Russian Federation, 2019).

After a dominant position is established, the antitrust regulator researches abuse of market power. Generally, there are two approaches to defining abuse of dominance in antitrust:

1) Direct indication of the types of actions of the dominant recognized as a violation. These actions are prohibited “per se” - without assessing and proving the consequences.

2) An indication of the consequences, if there is a causal relationship between the actions and the consequences, in the event of the occurrence or threat of occurrence of which any actions of the dominant are recognized as a violation.

Russian Federal Law "On Protection of Competition" of July 26, 2006 No.135-FZ (“On Protection of Competition”) directly lists 11 types of actions that are prohibited per se. Among such actions are the establishment or maintenance of a monopoly high price, the creation of discriminatory conditions, the imposition of unfavorable terms of the contract, etc. But the second approach is also used, and one of the listed consequences is enough to define dominant position violation (Federal Law No. 135-FZ):

1) Non-admission, restriction, elimination of competition.

2) Infringement on the interests of other persons or business entities in the field of entrepreneurial activity.

3) Infringement of the interests of an indefinite circle of consumers.

In Apple’s case the Regulator can find the subsequent violations of Russian antitrust Law:

I. Dominant position on the market

As established, Apple has a nearly 100% market share in iOS mobile applications distribution. Developers can hardly switch to another OS or another distribution channel to avoid the payment of a commission. Developers have several official options for bypassing Apple’s commission on developers revenue:

1. Distribute free application.
2. Distribute application with advertisement monetization.
3. Create an alternative payment system on other platform or through a browser.

The first option will completely deprive the developer of direct income. The second is also not realistic as the initial decision not to use ad monetization had reasons. For instance, income would be significantly lower or developers did not wish to spoil the user experience with advertising. The third option might work for some applications, but Apple limits informing the user about the possibility of using alternative methods. Thus, the possibility of finding an alternative to Apple's payment system for iOS applications looks unrealistic.

II. Imposing

Apple App Store and Apple's transactions acquiring are basically not one commodity. Other platforms like taxis, food delivery usually offer multiple payment methods. Since application marketplace and acquiring are different products, this case resembles bundling. Binding and imposing conditions that prevent the use of alternative payment systems payments can be possibly qualified as a violation of clause 3 h. 1 Art. 10 of 135-FZ Law "On Protection of Competition" - imposing on the counterparty the terms of the contract, unfavorable for him or not related to the subject of the contract.

III. Barriers to market access

The owners of alternative payment systems cannot access a huge market of iOS applications. Apple deprives them of the market and violates another prohibition - clause 9, part 1 of Art. 10 135-FZ Law "On Protection of Competition", creation of obstacles to access to the commodity market.

IV. Overpricing and price discrimination

Apple charges developers with 15-30% fee on users' in-app transactions and subscriptions, which is basically Apple's service price for software providers. The Law "On Protection of Competition" has a separate composition for cases of overpricing - the establishment of a monopoly high price.

It is not entirely clear for which particular set of services Apple charges a commission - directly for acquiring or for the ability to use the platform's infrastructure. Large game developers pay a stable 30% fee on in-app revenues, but commissions for external acquiring will be very small due to volume discounts. A developer of a large food delivery app with tens of thousands of downloads will work for free, while an indie developer of a text quest will pay 15%. There is discrimination in the first option since the infrastructure is used by everyone, and the minority pays for it. Consequently, Apple's actions show signs of 4 out of the 11 directly listed 'per se' abuses of dominance.

In August 2020, FAS came to the conclusion that Apple possesses a 100% share in iOS mobile applications distribution on iOS devices. Thus, Apple has a dominant position on the market of distribution iOS applications because iPhone and iPad owners can only legally install them from Apple's App Store (FAS Found Apple Abusing Its Dominant Position in the Mobile Apps Market, 2020).

Secondly, the regulator claimed that Apple exploited its dominant position to restrict competition on the parental control applications market. The iOS and Apple App Store platform owner limited "the tools and capabilities for developing parental control applications" which led to a loss of functionality by independent parental control software (FAS Found Apple Abusing Its Dominant Position in the Mobile Apps Market, 2020).

The decision of FAS leads to ruling with a prescription to end up violations. "According to part 1 of article 10 of the Law on Protection of Competition, actions (inaction) of an economic entity occupying a dominant position are prohibited, the result of which is or may be the prevention, restriction, elimination of competition and (or) infringement of the interests of other persons (business entities) in the field of entrepreneurial activity or indefinite circle of consumers." FAS prescribes Apple to eliminate the artificial barriers for parental control developers. Apple is allowed to keep the functionality in its applications too.

Moreover, Apple is ruled to get an arbitrary interpretation of the guidelines on its mobile app platform (Kaspersky's Antitrust Complaint against Apple in Russia, 2020).

In April 2021, FAS additionally fined Apple with a $12 million penalty for unfair competition with independent parental control applications. Federal Antimonopoly Service states that it demands from Apple to ensure its software does not have an unfair advantage in comparison to the competitors, parental control apps can be distributed via Apple App Store without degrading of their features. Apple claims it would appeal the regulator's decision, thus, possibly, the case is not over (J. Porter, 2021).

In sum, Kaspersky vs Apple antitrust investigation:

- Took nearly 1.5 years from filing a complaint to regulator's decision.
- Was filed on Kaspersky's home market, Russia (Russia is as well the biggest market for the application in terms of userbase and revenue, Appendix 5).
- Led to MDM changes, significant fee for a platform, recognition that Apple possesses and abuses dominant position. At the moment (June 2021), the execution of the FAS prescription is suspended due to Apple's attempt to appeal the decision in court.

3.3.2 Spotify Antitrust Complaint to the EU Competition Authorities

Spotify was founded by Daniel Ek and Martin Lorentzon as a music streaming service in Sweden where its HQ is located (BBC News, 2018). Spotify works as a platform for music artists and publishers, connecting the creators with listeners. At the moment, the company claims to be the most popular music subscription service with more than 350 million users and nearly 160 million subscribers on 178 markets (Spotify — Company Info, 2021).

In 2008 Spotify's application was launched on Apple App Store (Timeline, 2021). In 2014, Apple acquired its rival Beats Music and launched the service Apple Music in June 2015 with the same functionality as Spotify. Apple stepped into the music streaming service where it can possibly favor its own applications, Apple Music and, previously, iTunes (Höppner et al., 2019). Apple does not charge its services with a fee on revenues as it does with third-party music applications selling records and subscriptions on the Apple App Store. Spotify, after a series of restrictions in Apple App Store policies imposed unilaterally on mobile software developers, decided to stop selling subscriptions via the means of Apple's platform. By this Spotify tried to avoid commission and switch to alternative channels to sell its services (Europe Charges Apple with Antitrust Breach, Citing Spotify App Store Complaint, 2021). Old subscriptions of the users in the App Store purchased before 2018 are still charged with a 15% commission via Apple App Store. Nevertheless, according to App Annie (Appendix 6, Pic. 5.2), after Spotify turned off Apple App Store in-apps, the store lost at least $4.5 million of commission:

Average WW monthly Revenue 1 year before opt-out of in-apps in Apple App Store	$10 676 368
Average WW monthly Revenue 1 year after opt-out of in-apps in Apple App Store	$3 721 745
1 year difference in Spotify Net Revenue	$6 954 623
3 years difference in Spotify Net Revenue	$20 863 868

Lost in-apps commission if all new users (30% store commission)	$8 941 658
Lost in-apps commission if all continuing users (15% store commission)	$4 470 829
Lost in-apps commission if equal share of new and continuing users (30% and 15%)	$6 706 243

Table 2.1 Calculations of lost in-app commissions by Apple because of Spotify exiting Apple payment system. Based on App Annie data (revenue data is as a net of 30% platform commission) (App Annie, 2021)

Main concerns of Spotify as an app distributor dealing with Apple's digital platform (Vincent, 2019):

- Developers have to pay a 30% commission to the Apple App Store platform for every in-app transaction; after one year of a subscription a fee goes down to 15%;
- Some applications from independent developers that sell physical goods and services like taxi service Uber do not have to pay a commission for transactions to Apple which can be interpreted as discrimination (Byford, 2019);
- Apple's own applications do not have to pay a fee to a platform and thus can offer lower prices for similar products and services. Thus, Apple favors its software against competitors, e.g., Apple Music vs Spotify;
- Apple prevents 3rd party developers from direct communication with users if they try to avoid Apple's acquiring of in-app payments. Limitations include restrictions to send commercial offers, promotions, publishing of links to payments outside Apple App Store;
- Apple limits Spotify's growth on the iOS platform by a regular rejection of app versions with new functionality and fixed issues (Timeline, 2021);
- Apple does not allow Spotify as a rival to access other parts of the Apple ecosystem. For instance, Spotify cannot launch apps for Apple Watch, HomePod. Users cannot control listening to Spotify with Apple's virtual assistant Siri. Siri can only address commands to Apple's Apple Music (Timeline, 2021).

In March 2019 Spotify identified two rules in App Store Review Guidelines that are included in Apple's license agreement with application developers anticompetitive (Ranger, 2020). Spotify made an official complaint to the European Commission. The service developer claimed that Apple puts limitations on rivals by using dominant position in operation system iOS as well as Apple App Store holder (Höppner et al., 2019). Apple App Store harmed competition by charging excessive 15-30% commission that apps with digital goods have to share with a platform (Consumers and Innovators Win on a Level Playing Field, 2019b). In Spotify executives' point of view the fee could be lower if the acquiring market was be open for alternative payment systems. Law of supply and demand would drive commissions to a fair level (Mayo, 2021). Apple also limited apps' ability to promote cheaper options to purchase their services outside the platform (Ranger, 2020).

Spotify's founder and CEO Daniel Ek asserted in a press release: "Apple has introduced rules to the App Store that purposely limit choice and stifle innovation at the expense of the user experience" and "acts as both a player and referee to deliberately disadvantage other app developers" (Consumers and Innovators

Win on a Level Playing Field, 2019). Epic Games supported Spotify's antitrust case against Apple in September 2020 (Carman, 2020). However, regarding Spotify, there can be considerations that the service is at the same time a digital platform itself. Spotify has music producers and listeners on both sides thus it makes the search for the right decision even harder (Ramos & Blind, 2020).

The European Commission (EC) opened an investigation of Apple's App Store rules violating EU competition rules in June 2020. The rules under review are ones for applications that compete with Apple's own applications in the European Economic Area (EEA) - in the music streaming and e-books markets. The Commission takes a closer look at in-app purchasing system with a 30% fee on paid content for iOS users and restrictions imposed by Apple to inform application users about alternative ways to buy content which can be cheaper on the website of the service than in iOS application (European Commission, 2020b). The Commission opened an antitrust investigation against Apple under Article 101 of the Treaty on the Functioning of the European Union (TFEU) and/or on the abuse of a dominant position (Articles 102 TFEU), that are implemented according to the Antitrust Regulation (Council Regulation No 1/2003) (European Commission, 2020b). Regulator checks violation of competition on the markets where Apple works both as a distribution platform and application developer (European Commission, 2020).

By case law that is based on Article 102 TFEU, dominant position of a company presents when its economic power can be used to limit competition on the relevant market. For this, the company must have a market share of at least over 40% (Procedures in Article 102 Investigations, 2013). In the EU, competition regulation discipline only punishes dominant companies that commit actions to abuse market power.

Abusive actions mentioned in the Article 102 TFEU include, but are not limited to (Herz, 2017):

1. Excessive pricing – dominant companies set prices that do not represent the actual economic value of the goods;
2. Predatory pricing – charging prices that are below costs and used to eliminate competitors with fewer resources from the market.
3. Refusal to supply – unreasonable refusal to supply creditworthy customers.
4. Discrimination - application of unequal trading conditions or prices.
5. Tying – conclusion of contracts subject to supplementary obligations that have no connection with the subject matter of the contract. For example, a dominant company should not tie the supply of the product in question to a commitment to take ancillary products or services, particularly where the latter is not indispensable or where they could reasonably be provided by a third party.
6. Fidelity rebates - offering financial rebates or discounts in return for securing their business

EU Commission undertakes several steps during the process of investigation of EU antitrust rules abuse. Statement of Objections is one of the important stages on which suspected participants of the case are informed by the regulator about the objections against them (European Commission, 2021). On the 30th of April, 2021 the European Commission preliminarily stated that Apple uses its dominance to give preferences

to Apple Music over other competitors on the music streaming market. The Apple App Store uses its market power expressed in the monopolistic dominance over in-app purchases on the App Store (Mayo, 2021).

Apple imposes an obligation on the Apple App Store suppliers to use Apple's acquiring service. In parallel, platform participants cannot lead users to alternative purchasing channels being tied to the Apple App Store to distribute their digital services. Commission has concluded that Apple as a gatekeeper entered the music streaming market and drove subscription prices from $9.99 it demands for Apple Music to $12.99. Both sides of the market struggled from Apple's actions: Apple reduced rivals' profit margins, while actual iOS users are not able to change platforms to get a cheaper available option of music streaming (Europe Charges Apple with Antitrust Breach, Citing Spotify App Store Complaint, 2021).

At the stage of Statement Objection, the EU Commission notified Apple that from the regulator's point of view the company is violating competition law as a dominant player in the market of music streaming distribution on the Apple App Store. The Statement of objections, however, is not the final outcome of the probe. In case that Apple is recognized in breaking competition rules of the EU, it will violate Article 102 TFEU, which is implemented following the Antitrust Regulation (Council Regulation No 1/2003) (European Commission, 2021).

In Apple's first comments the company objects by claiming that Spotify's success as a streaming service was largely dependent on Apple App Store resources and it is unfair to demand from the platform to use it for free. According to the formal procedure, Apple has to give a written or oral answer to the EU Commission information in 12 weeks (Amaro, 2021).

In sum, Spotify vs Apple antitrust investigation:

- By the time of writing the paper it has already took over 2 years from filing the complaint to investigate the case. There is no legal deadline for the decision of antitrust regulation (European Commission, 2020). It depends on complexity of the case, thus the company can hardly predict period the case will be resolved (European Commission, 2020);
- Was filed in Spotify's home market, the EU - Sweden is a member of the EU since 1995 (Sweden, 2020);
- Led to cooperation of platform complementors against network o rchestrator (e.g., Epic supported Spotify's actions), intensification of The Digital Markets Act development to regulate platforms on the EU territory (Stolton, 2021; The European Commission Digital Markets Act: A Translation, 2021; How the Digital Markets Act Can Tame Big Tech, 2021).

4. DISCUSSION AND FURTHER RESEARCH

This section concludes the results of the analysis completed in the previous part of the paper. The initial hypothesis from the second part of the research are compared to the empirical evidence. The given part of the paper also provides managerial implications, states limitations of the current work and the used methodology and draws a path for future research.

4.1 Results and Hypothesis Testing

The analytical part and empirical data supported some of the abstracts from the theoretical part. The International Entrepreneurship perspective suggests that digital platforms, application stores in this research, help companies reach new customers and markets. However, the excessive power of digital ecosystem owners might deteriorate business conditions for the new entrants. They need to cooperate with other contributors against platform actions (Nambisan et al., 2019). In practice, mobile application developers create organizations against application store terms, e.g., a Coalition for App Fairness (CAF), Kapsersky's union with Kidslox, and AdGuard against Apple. The suppliers of mobile applications also support other platform members in antitrust investigations, e.g., Spotify and Epic Games against Apple.

The Orchestrator, the Apple App Store in the paper, builds and organizes the rules of participation on the platform – e.g. by app developer's guidelines and rules. Apple can prevent entering or exclude applications from the app store if they do not comply with the rules. The digital platform manages innovation – development of the store and new practices to distribute and promote mobile applications and coordinates complementors that create and deliver value (Nambisan & Sawhney, 2011).

O rchestrator try to achieve standard contracts in the relationship with other supply-chain members (Cafaggi, 2016; Jacobides et al., 2018). Management of app developing companies questionnaire as well as the standard list of documents a developer needs to sign once publishing its application on the Apple App Store provides the evidence of generalized contracts between application store and third-party developers.

In digital platforms, a leading downstream firm usually possesses more power (Bacchiega et al., 2016) – in the mobile application industry application stores mostly distribute the final goods. Powerful value chain participants can renegotiate conditions of the contract with weaker members unilaterally (Bacchiega et al., 2016). In 2011 Apple eliminated alternative payment systems for in-app purchases. In parallel, Apple prohibited the apps to show their users information about the existence of such options. It affected the profit of app developers, including Spotify (Timeline, 2021).

Downstream firms are capable of value appropriation (MacDonald & Ryall, 2004) – it supports the first hypothesis. Platform owners capture a large share of the value in a mobile app's global value chain. According to the industrial benchmark, paid applications share 15-30% of their revenue with the application store. At the same time, they bear significant R&D, maintenance, and marketing expenses, sometimes driving their profit close to 0. The Apple App Store in return provides a marketplace, governs the platform and its infrastructure, proceeds transactions, and gives developers access to iOS device users.

A theoretical model with gains and losses of distributing applications via application store and management questionnaire supported the second hypothesis. It stated that the preferable strategy of mobile app developers is to enter a global digital platform with strict contractual controls instead of not entering a market at all. If the app developer doesn't enter the platform, its economic profit is basically below zero. If a participant enters, it can passively take imposed regulation and generate rents being exposed to many risks. The model can work like this for some time, however, in lucrative categories, developers must be ready that the platform holder can enter the market as a participant. Application suppliers should develop other channels of distribution, have connections with other platform members and accumulate resources and for possible lobbying and trials.

The third hypothesis that mobile apps suppliers can reduce contractual controls of platforms-monopolists by complaining to competition authorities in various geographies is supported by empirical data provided in the analytical part. Kaspersky, Spotify, Epic Games are the recent and significant cases of independent developers trying to change regulation terms imposed by a digital platform. Companies filed antitrust complaints in various geographies. A successful decision of a Regulator in one country increases chances of success in other regions. By Avdasheva and Shastitko (2012), the decision of precedent made by competition authorities is known in other markets. The probability of infringement detection increases and monopolies can lose their incremental revenues in many regions while serious sanctions are significant only in several big markets. And, finally, the sum of sanctions imposed on a monopolist by national antitrust regulators in several regions can be bigger than the expected benefits from their violation.

The questionnaire revealed that the managers from the sample would tend to attract authorities of their home region. Kaspersky's product manager in the interview claimed that they made a complaint to the Russian FAS, Kaspersky's home country antitrust regulator. The team of lawyers usually has more experience in the home market. Moreover, Kaspersky preferred Russian FAS as it is faster in comparison to bigger markets like the EU and the US and is considered to be more loyal to a local firm. The results partly support the fourth hypothesis: when deciding which local competition authorities to attract, companies tend to file complaints in their home region. A positive decision can then be used by app developer managers on bigger markets that are more influential in their decisions and prescriptions.

The cases examination led to the following conclusions and managerial recommendations:

1) Application developers possess little bargaining power when dealing with application stores and comprehend they can hardly change standard contract terms, they can improve their position. App developers named several ways to advocate their interests on a platform: traditional negotiations with a platform holder, uniting into groups of developers or getting support from the authorities.

2) Weaker platform participants should lobby lawmakers and regulations/competition authorities to improve platform regulation and update competition law to non-traditional industries. This will make the platform ecosystem less prone to anti-competitive practices now and in the future.

3) Antitrust investigations on various markets might cost and last differently. It might be better for a developer to trigger competition authorities in the home region of the company. There are more chances of a positive decision of the regulator. After that, the firm might also file complaints to other more authoritative regulators in bid regions.

4.2 Research Limitations and Further Development of the Study

The research provides a complex study of mobile application industry specifics. The paper overviews the global value chain of mobile applications production and distribution, industry players, and their value division. A substantial part of the research is dedicated to the means of reducing contract pressure on application suppliers from the application stores side. However, there are possible gaps and opportunities for the future investigation of the topic:

1. The researchers encountered a limited number of studies regarding the topic of the paper. The means to increase the negotiation power of platform participants is a new direction of research. It needs new frameworks and modeling that can only partly be borrowed from traditional industries.
2. Several researched questions could be investigated only partly due to the limitation of open-source data. For instance, most of the app developing companies are not public. They do not disclose financial results, thus it would be hard to evaluate their financial performance and the possible effects of complaining to competition authorities.
3. Limited case study sample. With time, the research can be improved by investigating of more antitrust cases against digital platforms. In addition to Apple App Store, Google Play can be researched. Plus, later the sample of the completed antitrust cases would increase.
4. Limited survey sample. 9 participants of the questionnaire were current managers of app developing companies. Most of them were from the firms established in Russia, although with offices in other regions and application distribution worldwide. It would be better to enrich the sample with the managers from companies of other regions.
5. The interview part concerning complaining to antitrust authorities consists of an interview with Kaspersky's product manager. The research can be improved by deep study of managerial attitude to antitrust investigation against platforms from the side of Spotify, Epic games. Presumably, adjacent industries to mobile applications can also be researched for more profound results.
6. With more quantitative data, managerial scenarios could be calculated in addition to formalized model. Plus, with the increase of the case sample, the researchers could build a model with predicted consequences of opening the competition investigation.
7. The research can be enriched by the development of the topic from the other sides of the industry: in addition to the application developers, platform and user position could be researched thoroughly.

However, the current design of the study allowed the researchers to get conclusions that can be used by mobile app industry management. The results give instruments and sources for managers that consider the help of authorities in dealing with digital platforms on their contract terms and abusive practices.

5. CONCLUSION

The research provided a substantial array of theoretical and practical data concerning the global value chain of mobile applications. The work has a specific focus on the unexplored topic of the fostering bargaining power of mobile application developers in negotiation with platform holders. Usually, the optimal solution for an app developer is to enter a new platform with broad opportunities for app distribution. There, a platform complementor would encounter rigid and unified formal regulation and quality standards set by the Orchestrator.

Several possible solutions exist to advocate app suppliers' interests in the business network. They can seek the help of authorities and lobby their interests or try to protect their business by applying to existing regulation. In the situation of the absence of specific platform regulation, market participants can use the means of competition Law. Application developers usually distribute their services in several markets and can seek the support of competition authorities in different regions. However, home region regulators are often the most convenient starting point to apply to. Their decision might also become a positive case for a company to trigger investigations against a lead firm in other regions.

Cases of Kaspersky and Spotify complaining to competition authorities in Russia and the European Union shows that the antitrust investigation procedures, timing, and costs vary across the geographies. Based on the cases the research provides the analysis of antitrust investigation processes in Russia and the EU. Following the tested hypothesis, recent and planned changes in antitrust regulation in different regions, competition complaints against Apple in various jurisdictions the work offers managerial recommendations for mobile app developers. The findings can be useful for the firms that operate in adjacent industries and face contractual controls pressure from platforms.

It is important to take into consideration that the rigidity of antitrust authorities' solutions and consequences for the sides differ in the countries. There might be civil, administrative, and even criminal penalties for competition abuse for platforms in some regions. The influence of solutions of antitrust authorities on regulators from other countries is also different. Management of companies should make a careful and comprehensive study of all the inputs to choose the optimal instruments for strengthening a firm's bargaining power and decide on the region in case of claiming to antitrust authorities.

6. APPENDIX

Appendix 1 - Top-50 mobile software developers worldwide in downloads

iOS and Android mobile devices, June 2020 – May 2021[2]

Company Name	Company HQ	Parent Company Name	Company # Apps Owned	Downloads
Google	US	Google	319	2841281445
Voodoo	FR	Voodoo	378	1648161545
Lion Studios	US	AppLovin	299	1145381142
Outfit7	CY	Jinke Culture - Outfit7	82	950678151
Facebook	US	Facebook	43	935907120
Azur Interactive Games	RU	Azur Interactive Games	542	889338467
SayGames	BY	SayGames	136	828424818
BabyBus	CN	BabyBus	465	810339692
Crazy Labs	IL	Crazy Labs	527	775931783
Supersonic	IL	ironSource	83	761971854
Microsoft	US	Microsoft	230	740831799
InShot Inc	CN	InShot Inc	44	718186204
WhatsApp	US	Facebook	6	688429737
Tencent	CN	Tencent	595	641180569
Playgendary	DE	Playgendary	38	578649773
Good Job Games	TR	Good Job Games	68	548957300
Instagram	US	Facebook	13	542126717
Amazon	US	Amazon	159	493574886
Amanotes	VN	Amanotes	83	481718122
OneSoft	VN	OneSoft	207	479186759
Playrix	IE	Playrix	27	475419541
Zoom Video Communications	US	Zoom Video Communications	9	460020162
TikTok Pte Ltd	SG	ByteDance	9	440573796
Miniclip	CH	Tencent	64	381679036
Wildlife Studios	BR	Wildlife Studios	50	372449556
MX Player	IN	Times Group	20	368893950
Telegram	DE	Telegram	7	352064923
Adobe	US	Adobe	99	335567511
Snap	US	Snap	3	321348604
Rollic	TR	Zynga	52	309681486
Zynga	US	Zynga	181	308439525
Leap Fitness Group	SG	ABISHKKING	34	307969823
InnerSloth	US	InnerSloth	6	299721638
SNOW, Inc.	KR	NAVER	20	295775242
Garena Online	SG	Sea	44	294529367
King	GB	Activision Blizzard	50	293653797
BIGO	SG	JOYY Inc.	15	281079122
IVYMOBILE	HK	IVYMOBILE	91	275237296
Electronic Arts	US	Electronic Arts	112	266274232
Easybrain	BY	Easybrain	42	256550299
Gameloft	FR	Vivendi	222	252482332
Kwalee	GB	Kwalee	127	251123460
ShareChat	IN	ShareChat	6	240195386
My Town	IL	My Town	184	237085235
ByteDance	CN	ByteDance	50	234968220

[2] https://www.appannie.com/en/

Hazel Mobile	PK	Hazel Mobile	49	234837238
TutoTOONS	LT	TutoTOONS	408	232125303
Naxeex	RU	Naxeex	72	228324772
Supercell	FI	Supercell	20	219894462
Spotify	SE	Spotify	17	216972797

Appendix 2 - Top-50 mobile software developers worldwide in revenue

iOS and Android mobile devices, June 2020 – May 2021[3]

Company Name	Company HQ	Parent Company Name	Company # Apps Owned	Revenue
Tencent	CN	Tencent	595	4732548630
Playrix	IE	Playrix	27	2014073656
NetEase	CN	NetEase	454	2003159489
King	GB	Activision Blizzard	50	1383549874
Google	US	Google	319	1374475062
Supercell	FI	Supercell	20	1310082907
BANDAI NAMCO Entertainment	JP	BANDAI NAMCO	176	1225504094
Match Group	US	Match Group	74	1137178387
Roblox	US	Roblox	2	1086928644
Lilith	CN	Lilith	43	1062812326
SQUARE ENIX	JP	SQUARE ENIX	298	998279952
Niantic	US	Niantic	11	975418025
Moon Active	IL	Moon Active	4	878144233
NCSOFT	KR	NCSOFT	60	872173334
miHoYo	CN	miHoYo	31	864513244
Aniplex	JP	Sony	66	845627685
KONAMI	JP	KONAMI	57	840992366
LINE	JP	LINE	120	794005959
Netmarble	KR	Netmarble	92	720358257
XFLAG	JP	mixi	13	709595222
Disney	US	Disney	213	663094013
KingsGroup	CN	FunPlus	14	611400673
Garena Online	SG	Sea	44	603807741
Beijing Microlive Vision	CN	ByteDance	9	588870771
Scopely	US	Scopely	31	581350313
Playtika	IL	Playtika	25	544673847
FunPlus	CN	FunPlus	63	534315631
Zynga	US	Zynga	181	527163734
IGG	CN	IGG	99	525683598
Cygames	JP	CyberAgent	18	506519500
Aligame	CN	Alibaba Group	15	490303263
Peak	TR	Zynga	8	481548395
NEXON	JP	NEXON	83	461198394
BIGO	SG	JOYY Inc.	15	452885248
Product Madness	US	Aristocrat	11	422743393
Activision Publishing	US	Activision Blizzard	6	419128160
Electronic Arts	US	Electronic Arts	112	417928766
GungHo Online Entertainment	JP	GungHo Online Entertainment	38	406101326
Yotta Games	CN	Yotta Games	24	389828959
Long Tech Network	CN	Long Tech Network	5	377113022
Bole Games	CN	Bole Games	13	364729511
Plarium	IL	Aristocrat	26	339775304
37games	CN	37games	89	337582255
Kakao Japan Corp	JP	Kakao Japan Corp	3	336481879
Magic Tavern	CN	Magic Tavern	4	330024862
Twitch Interactive	US	Amazon	2	328697509
Big Fish Games	US	Aristocrat	1009	328445095

[3] https://www.appannie.com/en/

Small Giant Games	FI	Zynga	4	325189735
iQIYI	CN	Baidu	48	324421696
Jam City	US	Netmarble	115	322755454

Appendix 3 - Mobile applications downloads and revenue across the countries worldwide

iOS and Android mobile devices, June 2020 – May 2021[4]

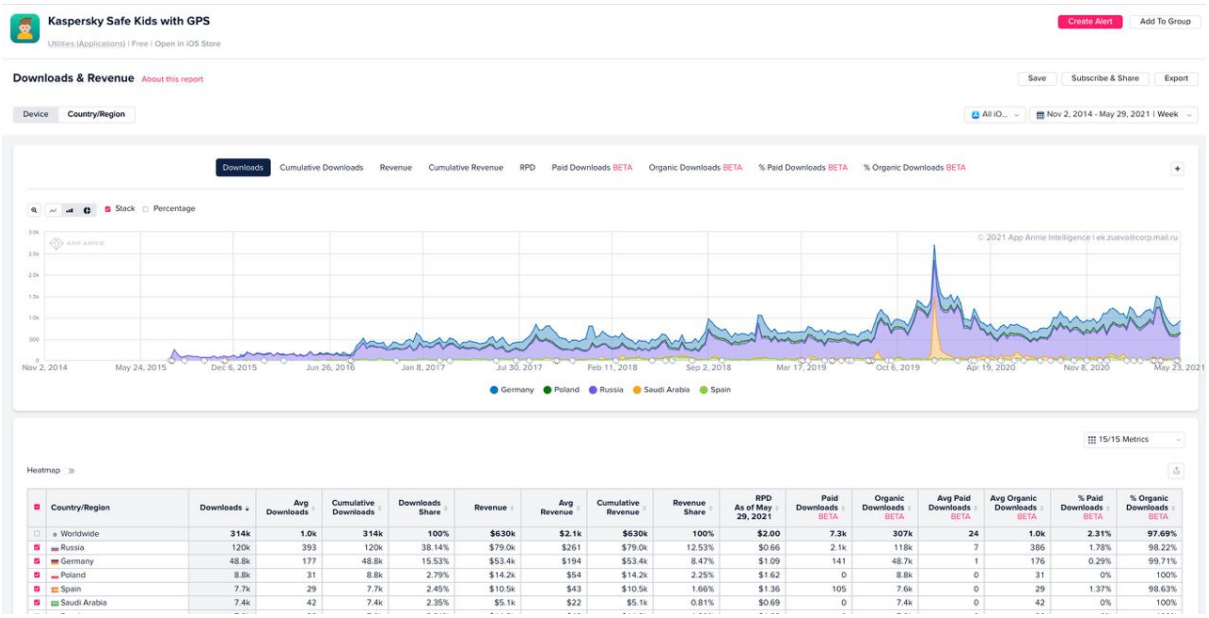
Country/Region	Country/Region Name	Downloads	Downloads Share	Revenue	Revenue Share
WW	**Worldwide**	**128 399 740 193**	**100,00%**	**83 831 834 581**	**100,00%**
IN	India	26 230 645 620	20,43%	328 614 861	0,39%
US	United States	12 646 731 589	9,85%	26 214 254 958	31,27%
BR	Brazil	10 221 420 699	7,96%	707 979 233	0,84%
ID	Indonesia	6 510 324 642	5,07%	341 588 825	0,41%
CN	China	6 464 880 474	5,03%	11 224 718 379	13,39%
RU	Russia	5 394 647 294	4,20%	965 357 316	1,15%
XX	Rest of the World	4 911 981 975	3,83%	1 497 296 135	1,79%
MX	Mexico	4 663 557 071	3,63%	387 195 713	0,46%
TR	Turkey	3 481 419 447	2,71%	440 971 047	0,53%
VN	Vietnam	2 624 986 407	2,04%	219 802 808	0,26%
PH	Philippines	2 589 533 353	2,02%	271 948 725	0,32%
JP	Japan	2 501 790 349	1,95%	14 737 507 443	17,58%
EG	Egypt	2 375 134 291	1,85%	104 292 769	0,12%
GB	United Kingdom	2 284 437 490	1,78%	2 659 784 434	3,17%
PK	Pakistan	2 251 768 046	1,75%	48 553 106	0,06%
DE	Germany	2 203 619 072	1,72%	2 530 300 481	3,02%
TH	Thailand	2 116 708 721	1,65%	648 302 373	0,77%
FR	France	2 056 247 017	1,60%	1 520 446 695	1,81%
KR	South Korea	1 966 679 123	1,53%	4 291 260 574	5,12%
SA	Saudi Arabia	1 852 170 039	1,44%	844 774 444	1,01%
IT	Italy	1 665 318 940	1,30%	737 836 444	0,88%
CO	Colombia	1 591 605 928	1,24%	79 217 554	0,09%
AR	Argentina	1 440 240 339	1,12%	108 925 043	0,13%
ES	Spain	1 374 203 981	1,07%	524 993 135	0,63%
MY	Malaysia	1 186 756 725	0,92%	398 048 170	0,47%
UA	Ukraine	1 180 500 369	0,92%	169 286 176	0,20%
CA	Canada	1 071 906 090	0,83%	1 760 662 618	2,10%
PE	Peru	943 550 182	0,73%	105 107 538	0,13%
CL	Chile	859 849 768	0,67%	198 593 672	0,24%
PL	Poland	836 863 132	0,65%	278 818 830	0,33%
KZ	Kazakhstan	835 288 955	0,65%	67 990 310	0,08%
AU	Australia	783 843 611	0,61%	1 489 867 780	1,78%
TW	Taiwan	726 696 434	0,57%	1 918 761 844	2,29%
ZA	South Africa	691 614 297	0,54%	160 258 592	0,19%
NG	Nigeria	666 398 659	0,52%	42 705 784	0,05%
NL	Netherlands	552 151 235	0,43%	483 749 894	0,58%
RO	Romania	495 707 333	0,39%	126 337 007	0,15%
AE	United Arab Emirates	486 498 685	0,38%	239 504 831	0,29%
IL	Israel	431 136 857	0,34%	180 836 021	0,22%
BE	Belgium	355 361 892	0,28%	282 675 107	0,34%
KE	Kenya	323 756 673	0,25%	37 249 826	0,04%
SE	Sweden	319 539 158	0,25%	382 839 556	0,46%
PT	Portugal	315 503 969	0,25%	128 153 152	0,15%
AZ	Azerbaijan	297 987 027	0,23%	37 347 558	0,04%
HK	Hong Kong	272 489 814	0,21%	637 370 527	0,76%
CZ	Czech Republic	271 778 531	0,21%	143 643 609	0,17%
HU	Hungary	239 838 458	0,19%	103 713 735	0,12%
GR	Greece	238 820 190	0,19%	116 735 715	0,14%
SG	Singapore	231 062 109	0,18%	376 799 273	0,45%
CH	Switzerland	228 533 906	0,18%	484 946 402	0,58%
LB	Lebanon	216 961 218	0,17%	34 689 997	0,04%
AT	Austria	216 407 205	0,17%	316 380 310	0,38%
CR	Costa Rica	188 037 038	0,15%	57 788 213	0,07%
DK	Denmark	185 196 265	0,14%	256 498 258	0,31%
KW	Kuwait	172 713 541	0,13%	265 528 689	0,32%
NO	Norway	161 185 414	0,13%	315 609 115	0,38%
IE	Ireland	161 040 283	0,13%	170 416 492	0,20%
NZ	New Zealand	158 158 446	0,12%	210 154 895	0,25%
BG	Bulgaria	154 596 093	0,12%	53 020 472	0,06%
FI	Finland	133 814 586	0,10%	133 422 243	0,16%
SK	Slovakia	130 385 449	0,10%	72 319 958	0,09%
HR	Croatia	110 339 088	0,09%	58 892 043	0,07%
LT	Lithuania	86 053 425	0,07%	50 366 080	0,06%
LV	Latvia	61 366 176	0,05%	48 821 794	0,06%

[4] https://www.appannie.com/en/

Appendix 4 – Managerial Questionnaire

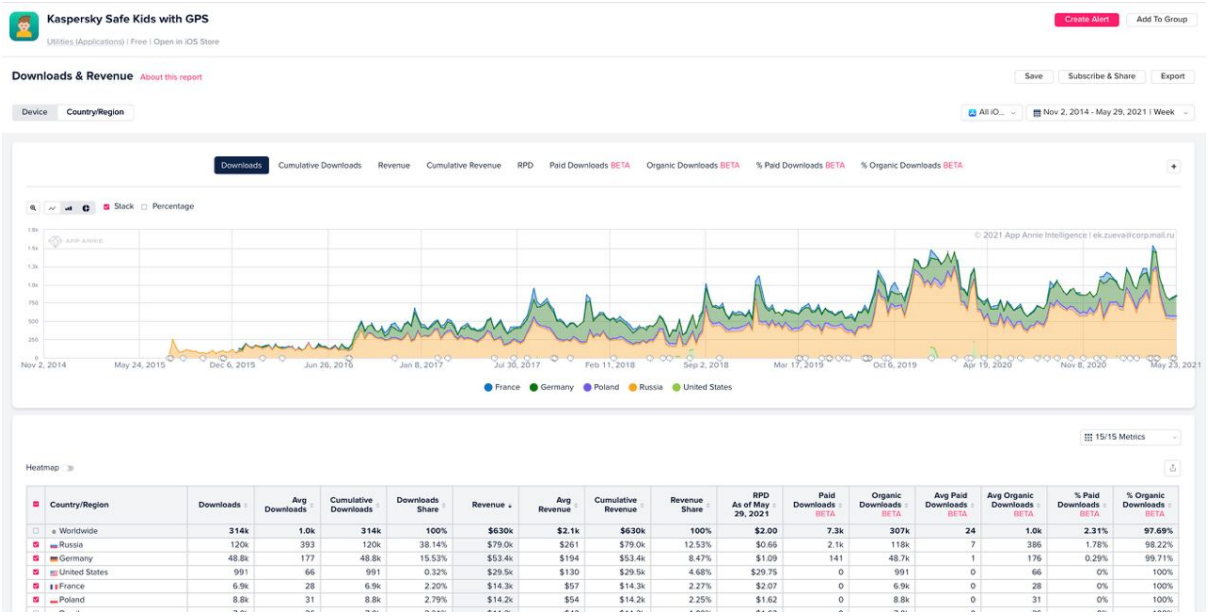
1.	The name of your application (optional) - further, if the question violates NDA, you can answer not about a specific application, but about the mobile application industry as a whole
2.	Why did you enter Apple App Store platform with your app and decided to distribute it through Apple's resources?
3.	How do you evaluate potential benefit of app distribution on the Apple App Store platform?
4.	Who in the company makes the decision to release an application on the Apple App Store platform?
5.	What agreements developers need to sign with the Apple App Store platform to start distributing their apps there?
6.	In your opinion, an individual application developer can influence the contractual terms of work with the platform, or the agreements are standard for all the publishers?
7.	What mechanisms exist in the industry to advocate developers' interests when working with digital platforms?
8.	Have you ever encountered problems with the Apple App Store (or Google Play) platform in the public law space?
9.	If yes, what was the reason?
10.	In the state institutions of which country did you apply (or would apply) with this problem?
11.	Why did you apply to the state institutions of this particular state?
12.	Who in the company files a complaint about the platform to government agencies?
13.	Further questions need answers if the reason for filing a complaint to state bodies is abuse by the platform of its dominant position:
14.	In which state did (would) you file a complaint to antitrust authorities?
15.	Why did (would) you apply to the competition authorities in this particular country?
16.	Was an antitrust investigation opened after your complaint?
17.	How would you rate the experience of complaining to antitrust authorities?
18.	In your opinion, would it help solve the cause of the conflict with the platform?
19.	How did the antitrust appeal affect (could affect) the platform's contract with a complaining app developer?
20.	In which markets would the effect of complaining to antitrust authorities against the platform be observed?

Appendix 5 – Kaspersky Safe Kids (iOS) Downloads and Revenue, App Annie[5]



Country/Region	Downloads	Avg Downloads	Cumulative Downloads	Downloads Share	Revenue	Avg Revenue	Cumulative Revenue	Revenue Share	RPD As of May 29, 2021	Paid Downloads BETA	Organic Downloads BETA	Avg Paid Downloads BETA	Avg Organic Downloads BETA	% Paid Downloads BETA	% Organic Downloads BETA
Worldwide	314k	1.0k	314k	100%	$630k	$2.1k	$630k	100%	$2.00	7.3k	307k	24	1.0k	2.31%	97.69%
Russia	120k	393	120k	38.14%	$79.0k	$261	$79.0k	12.53%	$0.66	2.1k	118k	7	386	1.78%	98.22%
Germany	48.8k	177	48.8k	15.53%	$53.4k	$194	$53.4k	8.47%	$1.09	141	48.7k	1	176	0.29%	99.71%
Poland	8.8k	31	8.8k	2.79%	$14.2k	$54	$14.2k	2.25%	$1.62	0	8.8k	0	31	0%	100%
Spain	7.7k	29	7.7k	2.45%	$10.5k	$43	$10.5k	1.66%	$1.36	105	7.6k	0	29	1.37%	98.63%
Saudi Arabia	7.4k	42	7.4k	2.35%	$5.1k	$22	$5.1k	0.81%	$0.69	0	7.4k	0	42	0%	100%

Picture 6.5.1 Kaspersky Safe Kids Top-5 regions, Total Downloads

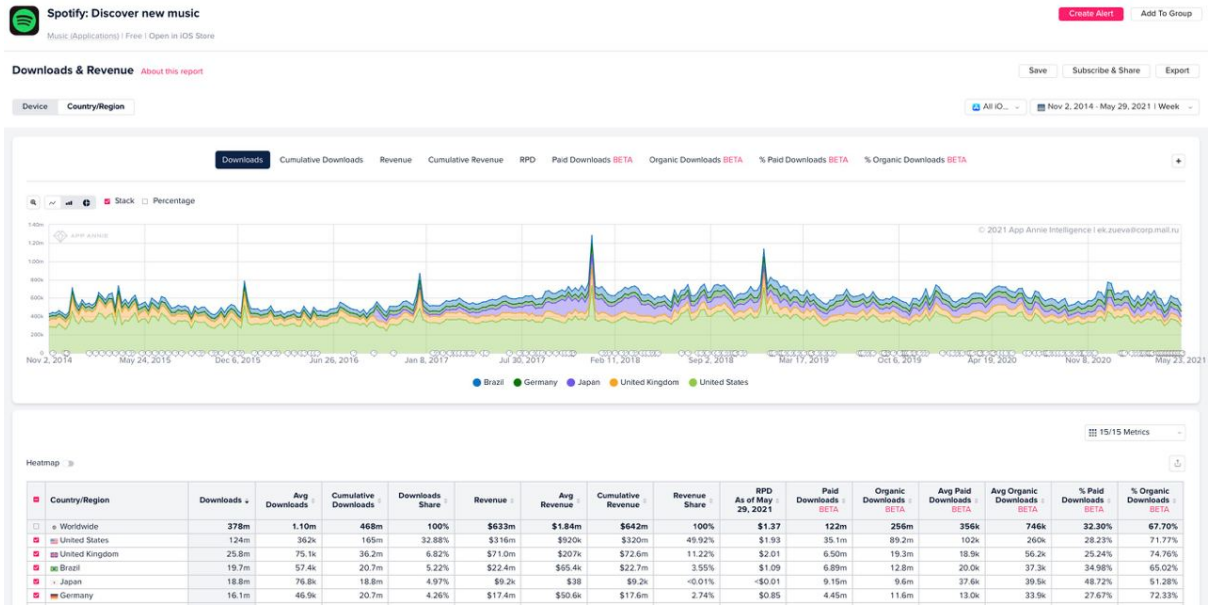


Country/Region	Downloads	Avg Downloads	Cumulative Downloads	Downloads Share	Revenue	Avg Revenue	Cumulative Revenue	Revenue Share	RPD As of May 29, 2021	Paid Downloads BETA	Organic Downloads BETA	Avg Paid Downloads BETA	Avg Organic Downloads BETA	% Paid Downloads BETA	% Organic Downloads BETA
Worldwide	314k	1.0k	314k	100%	$630k	$2.1k	$630k	100%	$2.00	7.3k	307k	24	1.0k	2.31%	97.69%
Russia	120k	393	120k	38.14%	$79.0k	$261	$79.0k	12.53%	$0.66	2.1k	118k	7	386	1.78%	98.22%
Germany	48.8k	177	48.8k	15.53%	$53.4k	$194	$53.4k	8.47%	$1.09	141	48.7k	1	176	0.29%	99.71%
United States	991	66	991	0.32%	$29.5k	$130	$29.5k	4.68%	$29.75	0	991	0	66	0%	100%
France	6.9k	28	6.9k	2.20%	$14.3k	$57	$14.3k	2.27%	$2.07	0	6.9k	0	28	0%	100%
Poland	8.8k	31	8.8k	2.79%	$14.2k	$54	$14.2k	2.25%	$1.62	0	8.8k	0	31	0%	100%

Picture 6.5.2 Kaspersky Safe Kids Top-5 regions, Total Revenue

[5] https://www.appannie.com/en/

Appendix 6 – Spotify (iOS) Downloads and Revenue, App Annie[6]



Country/Region	Downloads	Avg Downloads	Cumulative Downloads	Downloads Share	Revenue	Avg Revenue	Cumulative Revenue	Revenue Share	RPD As of May 29, 2021	Paid Downloads BETA	Organic Downloads BETA	Avg Paid Downloads BETA	Avg Organic Downloads BETA	% Paid Downloads BETA	% Organic Downloads BETA
Worldwide	378m	1.10m	468m	100%	$633m	$1.84m	$642m	100%	$1.37	122m	256m	356k	746k	32.30%	67.70%
United States	124m	362k	165m	32.88%	$316m	$920k	$320m	49.92%	$1.93	35.1m	89.2m	102k	260k	28.23%	71.77%
United Kingdom	25.8m	75.1k	36.2m	6.82%	$71.0m	$207k	$72.6m	11.22%	$2.01	6.50m	19.3m	18.9k	56.2k	25.24%	74.76%
Brazil	19.7m	57.4k	20.7m	5.22%	$22.4m	$65.4k	$22.7m	3.55%	$1.09	6.89m	12.8m	20.0k	37.3k	34.98%	65.02%
Japan	18.8m	76.8k	18.8m	4.97%	$9.2k	$38	$9.2k	<0.01%	<$0.01	9.15m	9.6m	37.6k	39.5k	48.72%	51.28%
Germany	16.1m	46.9k	20.7m	4.26%	$17.4m	$50.6k	$17.6m	2.74%	$0.85	4.45m	11.6m	13.0k	33.9k	27.67%	72.33%

Picture 6.6.1 Spotify Top-5 regions, Total Downloads (only Germany is among the EU countries)

Country/Region	Downloads	Avg Downloads	Cumulative Downloads	Downloads Share	Revenue	Avg Revenue	Cumulative Revenue	Revenue Share	RPD As of May 29, 2021	Paid Downloads BETA	Organic Downloads BETA	Avg Paid Downloads BETA	Avg Organic Downloads BETA	% Paid Downloads BETA	% Organic Downloads BETA
Worldwide	378m	1.10m	468m	100%	$633m	$1.84m	$642m	100%	$1.37	122m	256m	356k	746k	32.30%	67.70%
United States	124m	362k	165m	32.88%	$316m	$920k	$320m	49.92%	$1.93	35.1m	89.2m	102k	260k	28.23%	71.77%
United Kingdom	25.8m	75.1k	36.2m	6.82%	$71.0m	$207k	$72.6m	11.22%	$2.01	6.50m	19.3m	18.9k	56.2k	25.24%	74.76%
Norway	2.24m	6.5k	3.64m	0.59%	$28.8m	$84.1k	$29.3m	4.56%	$8.04	110k	2.13m	322	6.2k	4.91%	95.10%
Sweden	4.25m	12.4k	7.12m	1.13%	$28.7m	$83.8k	$29.3m	4.54%	$4.11	602k	3.65m	1.8k	10.7k	14.14%	85.86%
Australia	11.5m	33.6k	14.4m	3.05%	$22.9m	$66.8k	$23.3m	3.63%	$1.61	3.34m	8.19m	10k	23.9k	28.94%	71.06%

Picture 6.6.2 Spotify Top-5 regions, Total Revenue (only Sweden is among EU countries)

[6] https://www.appannie.com/en/

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Summary Report
Abstract

Title: Means of Reducing Contractual Controls by Suppliers of Mobile Applications in the Global Value Chain of Digital Platforms exemplified by Kaspersky and Spotify Access to Apple Ecosystem

Academic year: 2020-2021

Course: [N009] - Markets, Regulations and Law

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Key words: GVC, Value Chains, Contracts, Regulation, Competition authorities, Antitrust Investigation, Platform, Mobile applications

Purpose: The purpose of the work is to research the global value chain of mobile applications, understand contractual controls of digital platforms over mobile app suppliers, and the means to increase the power of software developers. The focus of the study is on the effectiveness of filing competition law complaints against platforms.

Methodology: (a) work with primary and secondary sources of data, (b) literature review, (c) interview, (d) questionnaire, (e) a case study of Kaspersky and Spotify complaining to competition authorities to affect Apple's power.

Literature review: This study is based on theories of global value chains, platform enterprises, governance and negotiations over contractual controls, as well as on previous findings about platform regulation and antitrust investigations.

Empirical framework: In the qualitative study a survey is based on a sample of 9 managers from different mobile app companies distributing services globally with the means of the Apple App Store. The interview is based on questions addressed to Kaspersky's product manager. Case study includes antitrust investigations: Kaspersky vs Apple (Russia), Spotify vs Apple (the EU).

Findings: The study concludes that application developers can seek the support of competition authorities in different regions to strengthen their bargaining power in contract negotiations with platforms. Home region regulators are often the most convenient starting point to apply to. Their decision might become a positive case for a company to trigger investigations against a lead GVC firm in other regions.

1. INTRODUCTION

Platform ecosystems have emerged in different industries and reshape the traditional approach to the creation and distribution of goods and services (Porter & Heppelmann, 2015). Platforms bring together participants of the transaction and facilitating interactions between them by leveraging network effects, building governance structures, creating value (Wen & Zhu, 2019).

Platforms are a new approach to a global value chain (GVC) concept that implies networks of independent and geographically separated firms interlinked in input-output supply systems of production and marketing (Gibbon & Ponte, 2008). GVCs are characterized by the asymmetry of power distribution and incentives of the leading firm to leverage the dominant position (Strange, 2011). GVC management requires governance structures that can be formal and informal. Contract terms that companies negotiate reveal how the firms split competencies and resources along the GVC (Gibbon & Ponte, 2008). To reach an agreement on contract terms that satisfies their interests, complementors need to strengthen bargaining power. The means to reduce negative contractual conditions vary from strengthening alternative distribution channels (Wang & Miller, 2019) to lobbying and filing antitrust complaints against the dominant firm.

Although platforms are common in different markets, there is a lack of scientific understanding of the phenomenon and subsequent governmental control. There have been recent movements towards the regulation of digital platforms in different regions, for instance, The Digital Markets Act (DMA) in the European Union (EU) and the fifth antimonopoly set of amendments by the Federal Antimonopoly Service (FAS) in Russia.

One of the industries that function because of platforms is the mobile applications production. Mobile applications are complementing goods to smart devices that allow users customize their gadgets to specific needs and demands. Mobile app stores are the core channels of mobile application distribution. Consumers with Apple devices are basically limited to a single source of applications – the Apple App Store, a gateway to the iOS ecosystem (Höppner et al., 2019). Tech giants play both as owners of the platforms and participants of the mobile apps market. They can eliminate competitors from the market, reject to list third-party services, infringe patents of small rivals (Rey, 2020). In the mobile apps GVC, a platform captures up to 30% of apps revenues only on in-app purchases (Haslam et al., 2013).

In the research we distinguish possible decisions of a software developer concerning app distribution via mobile application stores. Firstly, a third-party developer can avoid entering a platform or leave it. Secondly, a software producer can enter a platform and take all the contractual terms it imposes. Thirdly, a mobile app supplier can enter the platform and try to advocate its interests in contract terms. In case of choosing the last option, a software developer might try to get support from the authorities against platforms to enhance its interests in the existing rules or lobby new regulation.

Kaspersky and Spotify have applied to the antitrust authorities of their home regions against Apple. Kaspersky triggered an investigation at Russian FAS. The developer claimed that Apple had limited access of third-party applications to the information needed to support the features of parental control apps. Apple

started to pre-install its service Screen time with the functions of parental control services on all iOS devices (Shastitko et al., 2020).

Spotify's main concern addressed to the European Commission (EC) is the 30% fee on revenues app suppliers. Apple prohibits the promotion of paid services available through other channels except for Apple App Store. Spotify claims that Apple gets an unfair competitive advantage on the market of music streaming for its application Apple Music (Consumers and Innovators Win on a Level Playing Field, 2019). Competition authorities of Russia and the EU investigate whether Apple carried out an anticompetitive behavior (Thompson, 2020).

Although there is a substantial theoretical base on global value chains and their governance, the current studies lack focus on platforms as a relatively new phenomenon. The paper provides possible means of enhancing the bargaining power of the mobile apps GVC participants with the focus on filing a complaint to antitrust authorities against a lead firm. A positive court decision regarding the abuse of market dominance can be applicable for competition regulators in other markets, which will enhance app producer business conditions.

The structure of the paper is as follows: in the theoretical part of the research definitions, concepts, and frameworks regarding GVCs and digital platforms, their governance, and means to renegotiate contract conditions get developed. The analytical part of the work focuses on industry analysis, qualitative and quantitative research. The study highlights the purposes of management, the decision-making process of local regulators, results, and consequences of the antitrust investigations. A questionnaire of the industry management and the interview with the Kaspersky product manager support the conclusion. The two cases of Kaspersky vs Apple and Spotify vs Apple are reviewed in the qualitative part of the work. In the qualitative part, there are calculations of losses of the platform because of non-compliant behavior. In addition, the research provides a possible model for the platform entrants. The main tested hypothesis is that mobile apps suppliers can reduce contractual controls of platforms and by applying to competition authorities.

2. THEORY

This part of the work provides a literature review and key theoretical concepts on the topic of the dissertation. The section includes definitions and frameworks of global value chains, platform enterprises, contracts and negotiations over them, and antitrust regulation. It ends with the construction of hypotheses that get checked in the analytical part.

2.1 Definitions, Frameworks, Theories on Global Value Chain

2.1.1 Networks and Global Value Chain

Value chain is the full range of activities to bring a product from idea to consumer, including manufacturing, logistics, marketing, sales, and subsequent services (Porter, 1985). Global value chain (GVC) term is applied to the management of independent and geographically dispersed value chains of multinational enterprises (MNEs) (Kano, 2018); Gibbon & Ponte, 2008). The main goal of building a GVC is to use the firm's obtained and created knowledge effectively, strengthen it with the capabilities of companies from different locations. (Cantwell and Mudambi, 2005; Tallman and Chacar, 2011).

GVC is a business network that connects various participants in one system of interdependent actors (Jacobides et al., 2018). GVCs are asymmetrical low-density and high-centrality networks that have a leading orchestrating company at the center (Rowley, 1997). Participation in business networks means that companies are affected by various network effects (Why Some Platforms Thrive and Others Don't, 2020).

2.1.2 Members of a Global Value Chain

GVCs are characterized by the membership. The roles, responsibilities and value division of GVC participants differ significantly. The main groups of participants in a GVC are the orchestrating firm and the complementors (Rugman & Cruz, 2000). Power asymmetry in a GVC means that an orchestrating firm has a strategic position in the value chain (Kano, 2018). Transnational corporations (TNCs) usually take roles of Orchestrators in supply chains, outsourcing many of their activities and retaining innovation and branding for inhouse development (Aguiar de Medeiros & Trebat, 2017). Due to power asymmetry, the Orchestrator controls partners in the network and can get excessive rents (Strange, 2011). In return for giving up some of the strategic decisions to the GVC leading firm, other participants get access to FSAs: brand names, technologies, organizational capabilities (Kano, 2018).

2.1.3 Digital Platforms as a Form of a Global Value Chain

Digital technologies reshape traditional approaches to supply chains, distribution networks, and value chains (Strange & Zucchella, 2017). Gawer and Cusumano (2002), Gawer(2014) defined platforms as a "shared set of technologies, components, services, architecture, and relationships that serve as a common foundation for diverse sets of actors to converge and create value". Value in digital platforms is created by facilitating commercial transactions between multiple sides of product and service markets brought together on the platform with strong network effects (Cusumano et al., 2019).

Gawer and Cusumano (2008), Parida et al. (2019) define a platform-based ecosystem as "a network where a platform owner encourages third parties to develop complementary innovations and the resulting network of firms manifests significant interdependencies". By Jacobides et al. (2018), they are complex networks with interdependencies and links in input, resources, and output that extend beyond a sum of the contributors, which foster synergies and co-specialization.

Ecosystem participants may play many different roles, for instance, orchestrator, integrator, complementor (Jacobides et al., 2018). The Orchestrator builds and organizes the rules of participation, manages innovation, coordinates complementors (Nambisan & Sawhney, 2011).

2.2 Contractual Controls by Suppliers in Global Value Chains: a Literature Review

2.2.1 Governance Systems and Contracts in Global Value Chains

Gibbon and Ponte (2005) state that "governance in GVCs is the process of organizing activities with the purpose of achieving a certain functional division of labour along the chain resulting in specific allocations of resources and distributions of gains". Key product and process parameters are usually set by a lead firm (Gereffi, 1994).

Benito, Petersen and Welch (2019) state that GVCs should be governed with the use of both formal and relational coordination mechanisms. Formal contracts state the terms and conditions of further behavior of the parties in detail, allow imposing penalties on the violators that extend beyond non-legal sanctions (Mouzas & Ford, 2012; Stinchcombe, 2001). Contractual controls, by definition, are a type of formal control that sets guidance and ensures compliance with the defined rules and procedures, constraints, and expected performance by participants of the contract (Li et al., 2009; Das & Teng, 2001).

The terms of formal agreements often need discussion and bargaining before the sides of the relations sign them. Contract obligations have a tying nature in subsequent business interactions. A strong party can impose its conditions on a weak side of a contract without negotiations with a principle "take it or leave" (Rey, 2020).

2.2.2 Negotiation Process over Contracts and Bargaining Power in GVCs

Contracts help to organize the relations between the participants and facilitate interactions between the different parties. Lead firms try to achieve standard contracts in the relationship with other supply-chain members (Cafaggi, 2016).

Legal contracts often require aggressive negotiations to settle the issues provoked by them (Joshi & Arnold, 1998). Lusch and Brown (1996) state that misused contracts or contracts with non-optimal conditions can create conflicts. Cafaggi and Iamiceli (2014) state that GVCs' participants use internal mechanisms as committees and dispute resolution instruments. The role of courts, judiciary, and arbitration as last resort instruments is limited, and corrective solutions are prioritized in GVCs. GVC participants might seek the help of authorities and the judiciary system in the protection of their interests. If a dispute arises, the companies concerned can choose among different regions for dispute resolution (Zekos, 2003).

When firms involved in GVCs apply to authorities, they might prefer their home markets as legislators have the motivation to capture value in their jurisdiction (Avdasheva & Shastitko, 2012)

2.3 Specifics of Mobile Applications Suppliers' Contractual Controls in Digital Platforms

2.3.1 Contractual Controls in Digital Platforms

Digital platforms and ecosystems set specific rules that help manage membership and participant relationships (Jacobides et al., 2018). Governance of the digital ecosystem is usually a prerogative of a lead firm (Nambisan et al., 2019). Control of participants' access to the main technologies is one of the main goals of contracts in ecosystems (Cennamo, 2016). Orchestrating firm prefers standardized contracts with partners (Jacobides et al., 2018).

When entering a platform, suppliers sign agreements with a lead firm. A platform imposes complementors on the terms of trade, quality levels, and provided services. Digital platforms get agreement to collect information about sales, price, packaging, and other data of the complementors. Then the platform can exploit the information in their interest, for example, to enter the complementor's market (Committee for the Study of Digital Platforms, 2019).

2.3.2 Possible Means of Reducing Contractual Controls in Digital Platforms

In digital platforms, a leading downstream firm usually possesses more power bargaining power (Bacchiega et al., 2016). To reduce contractual pressure, GVC members can:

1) Unite with other participants to act collectively (Nakanishi, 2020).
2) Strengthen alternative distribution channels (Wang & Miller, 2019).
3) Withhold high-demand product offering from a platform (Wang & Miller, 2019).
4) Lobby lawmakers and regulators to change existing legal and regulatory frameworks.
5) File complaints to state organizations based on existing rules to advance their interests.

One of the possible options is to exploit the resources of competition authorities when a platform abuses its market power against complementors.

2.3.3 Competition Law as a Mean of Reducing Contractual Controls

Complementors of digital platforms might seek the help of authorities to strengthen their position in dealing with a platform owner. In most jurisdictions, platform and digital ecosystem regulations are not completely developed and defined. Currently, antitrust Law as is an instrument to influence platform holders. Companies and individuals might initiate private or public antitrust enforcement. Remedies and sanctions used by national antitrust authorities vary in different regions (OECD, 2021). By Avdasheva and Shastitko (2012), a successful decision of a regulator in one country increases chances of success in other countries.

The EU antitrust regulation practice protects the market from the "dominance" of powerful players. The core sources defining competition regulation in the EU are articles 101 and 102 TFEU. In Russia, Federal Antimonopoly Service exercises control and supervision in the field of competition. The antitrust

regulation in Russia is bases on the Russian Federal Law of July 26, 2006, N 135-FZ "On Protection of Competition".

Competition authorities' decisions can strengthen suppliers' position in the network on an individual level or lead to global shifts in the industry and cross-border operations. This is a direct consequence of the deterrent effect of competition law sanctions. Specific deterrence means that an established competition law precedent helps weaker sides deter a stronger side from continuing to commit a specific violation or committing the same violation again. General deterrence means that a precedent may deter other stronger parties from engaging in conducts similar to those already sanctioned. This is because the regulators will possibly treat similar violations alike and follow the precedent.

To evaluate the effectiveness of filing a complaint to local competition authorities against a platform by mobile application suppliers, qualitative and quantitative methods are used in the second part of the paper. The main tested hypothesis in the work are:

1. Platform owners capture a large share of the value in a mobile apps global value chain.
2. Preferrable strategy of mobile app developers is to enter a global digital platform with contractual controls instead of not entering a market at all.
3. Mobile apps suppliers can reduce contractual controls of platforms-monopolists by complaining to competition authorities in various geographies.
4. When deciding which local competition authorities to attract, companies tend to file complaints in their home regions.

3. ANALYTICAL PART

This part of the work provides a review of mobile application industry. The section includes qualitative research of possible means to increase app developers bargaining power with platforms. A questionnaire for industry management, an interview and two case studies help to test the hypothesis of the paper. Qualitative research includes calculations of platform's losses on commission and a formalized model of developers' decision to work with a platform.

3.1 GVC of Mobile Applications: Participants, Captured Value

3.1.1 Mobile Applications Value Chain Participants

Mobile applications are software developed for devices to perform specific tasks. Third-party suppliers produce apps for the mobile ecosystem and use platform resources to enter new markets, create value (Wen & Zhu, 2019). In turn, platform holders need a variety of applications for OS to increase total value of the system (Höppner et al., 2019).

Software developers have significant initial costs on research and development (R&D). Kinvey report states that app development on average costs $270,000 (Blair, 2017). After the application is ready and published, marketing and maintenance costs take a significant share. Marketing costs constitute at least $10,000 per month (AppsFlyer, 2020).

This research focuses on applications that have paid content, in-app purchases, subscription. App stores charge app developers with a 15-30% commission on in-app revenues (Kwan, 2020). They take a significant share of app suppliers' value for the marketplace provision and payments processing, leaving some producers with no profit (Borck et al., 2020).

3.1.2 Application Stores as Platforms with Abuse of Market Dominance

Digital platforms in the smart devices industry connect users with applications from multiple independent publishers. Digital platforms provide other companies with tools to develop, supply, and promote their services (Gilbert, 2020). App stores act as gatekeepers of their ecosystems. App be rejected or removed from the store (App Store vs Google Play: Stores in Numbers - Masters Blog, 2018).

Platforms have incentives to enter the supply side of their marketplace to get more revenue. This creates a conflict of interest as a platform keeper will commercially favor its own products (Höppner et al., 2019). By becoming a platform keeper and a participant at the same time, tech giants can imitate rivals and suppress competition (Gilbert, 2020).

Apple owns the whole vertically integrated digital ecosystem of hardware, software, app store, and applications, controls over the provision of mobile applications on the iOS devices (Höppner et al., 2019).

Contractual Controls Power in Negotiations with Application Stores

Platform owners set rules for all the participants of digital ecosystems (Yi et al., 2019). Application developers deciding to enter the Apple App Store to distribute their applications have to sign formal documents. Applications published on a platform must conform with Apple's guidelines (App Store Review Guidelines - Apple Developer, 2021). In basic rules and terms, Apple contracts are similar for the developers

for the ease of control of their compliance(Create an Apple App Store Paid Applications Contract, 2021). Sometimes members of GVC want to change the status quo of control instruments set by a leading firm (Gibbon & Ponte, 2008).

3.2 Evaluation of Managerial Scenarios of Working with Digital Platforms

For the purposes of this research, a questionnaire for managers of the mobile applications industry was created, sent, and analyzed. The survey included questions:

1. Reasons why developers decide to enter Apple App Store to distribute their applications.
2. Means to advocate their interests in negotiations with Apple.
3. Incentives (real or possible) to file a complaint to competition authorities.

All the participants answered that their decision to enter the platform was mostly motivated by a desire to increase income and i userbase, enter new markets and support multi-homing features. Most of the managers in the sample answered that contractual terms with platforms cannot be modified by complementors, however, some state that the rule of fixed terms have exclusions: “It depends, you could negotiate special offers in case your app portfolio of apps has a dominating market share and very profitable for the platform”. To advocate developers’ interests, survey participants suggested negotiating with Apple, unite into groups of developers or get support from the authorities.

3.2.1 Option 1: Do not Work with a Platform

There are various factors that can affect third-party supplier’s decision leave the market. The most obvious ones are profitability, switching costs (De Figueiredo & Silverman, 2007). Formalized incentive not to distribute applications via platform:

Application LTV = $\sum_{i=1}^{n}$ Profit$_i$ = $\sum_{i=1}^{n}$(-(RnD Cost$_i$ + Maintenance Cost$_i$ + Marketing Cost$_i$ + Store Presence Cost$_i$) + Revenue$_i$ * (1-Store Commission$_i$) + Functionality of Multiplatform App + Technical Expertise + User Data)

In case the application decides not to operate on a platform initially, it bears no costs and receives no revenue. However, some users value multi-platform feature, while user data can be collected and analyzed for app improvement on other OS as well:

Profit = - (Functionality of Multiplatform App + Technical Expertise + User Data) ≤ 0

3.2.2 Option 2: Work with a Platform and Take the Contract Terms

A software company that works on a platform can either comply with the rules and requirements of the Apple App Store or try to change the conditions in their interest. If a company decides to operate in the platform’s conditions:

Application LTV = $\sum_{i=1}^{n}$ Profit$_i$ = $\sum_{i=1}^{n}$(-(RnD Cost$_i$ + Maintenance Cost$_i$ + Marketing Cost$_i$ + Store Presence Cost$_i$) + Revenue$_i$ * (1-Store Commission$_i$) + Functionality of Multiplatform App + Technical Expertise + User Data)

If the developer's profit can be negative if some variable or fixed costs are too high, for instance, maintenance or marketing) while cashflow after the app store's fee is low. The app store can affect 'n' by entering app's market category or by rejecting the application.

3.2.3 Option 3 – Work with a Platform, but Demand better Contract Conditions

Companies that distribute their mobile software via application stores might decide to strengthen their positions in their business relations with a platform using several strategies:

1. By joining a coalition of other participants for collective actions.
2. By diversifying distribution channels, product portfolio (Wen & Zhu, 2019).
3. By applying for the help of authorities in dispute resolution or try to lobby lawmakers and regulators (Keizer, 2013; European Commission, 2018).

Application LTV = $\sum_{i=1}^{n}$ Profit$_i$ = $\sum_{i=1}^{n}$(- (RnD Cost$_i$ + Maintenance Cost$_i$ + Marketing Cost$_i$ + Store Presence Cost$_i$ + Change of Contract Cost$_i$) + Revenue$_i$ * (1-Store Commission$_i$) + Functionality of Multiplatform App + Technical Expertise + User Data)

In case when developer tries to change the terms of the platform's contractual controls, an additional 'Change of Contract' cost is added to the formula. It might include legal support, judicial costs, PR, and coordination of unions with other developers. If the efforts are successful, a developer can increase 'n', diminish Store Commission or enhance User Data.

3.3 Case Studies of Kaspersky and Spotify

3.3.1 Spotify Antitrust Complaint to the Russian Competition Authorities

Kaspersky is an international software developer established in Russia. Kaspersky's Parental control application Kaspersky Safe Kids (KSK) allows parents to control their children's devices, monitor their location, limit access to content. KSK is distributed as a separate app and a part of bundled products of the developer (Kaspersky Safe Kids, 2021).

Apple has been restricting and removing parental control applications from the App Store (Slivka, 2019). Kaspersky filed a complaint to FAS in March 2019. Antivirus developer claimed that the platform made it remove functionality of the Kaspersky Safe Kids application when Apple stepped into the parental control market with a built-in feature for iOS Screen time in September 2018 (Cimpanu, 2019). In the press release, Kaspersky mentioned other parental control applications that lost their functionality and decided to unite against the platform: Kidslox and AdGuard (Kaspersky's Antitrust Complaint against Apple in Russia, 2020).

In August 2020, FAS came to the conclusion that Apple had a 100% share in iOS mobile applications distribution and a dominant position. The regulator claimed that limited "the tools and capabilities for developing parental control applications" which led to a loss of functionality by independent parental control software (FAS Found Apple Abusing Its Dominant Position in the Mobile Apps Market, 2020).

FAS prescribes Apple to eliminate the artificial barriers for parental control developers. Moreover, Apple is ruled to get an arbitrary interpretation of the guidelines on its mobile app platform (Kaspersky's Antitrust Complaint against Apple in Russia, 2020). In April 2021, FAS fined Apple with a $12 million penalty for unfair competition. Apple claims it would appeal the regulator's decision, thus, possibly, the case is not over (J. Porter, 2021).

In sum, Kaspersky vs Apple antitrust investigation:

- Took nearly 1.5 years from filing a complaint to regulator's decision.
- Was filed on Kaspersky's home market, Russia. Russia is also the biggest market for the application in terms of userbase and revenue.
- Led to MDM changes, significant fee for a platform, recognition that Apple possesses and abuses dominant position. At the moment (June 2021), the execution of the FAS prescription is suspended due to Apple's attempt to appeal the decision in court.

3.3.2 Spotify Antitrust Complaint to the EU Competition Authorities

Spotify is a music streaming service that works as a platform connecting the music creators with listeners (Spotify, 2021). In 2008 Spotify launched the app on the Apple App Store (Timeline, 2021). In 2014, Apple launched Apple Music with the same functionality as Spotify. Apple stepped into the music streaming service where it can possibly favor its own applications, Apple Music and, previously, iTunes (Höppner et al., 2019).

In March 2019 Spotify made an official complaint to the European Commission. The service developer claimed that Apple puts limitations on rivals by using dominant position in operation system iOS as well as Apple App Store holder (Höppner et al., 2019). In Spotify point of view the 15-30% fee could be lower if the acquiring market was be open for alternative payment systems (Mayo, 2021). Apple also limited apps' ability to promote cheaper options to purchase their services outside the platform (Ranger, 2020).

The European Commission (EC) opened an investigation of Apple's App Store rules violating EU competition rules in June 2020. Regulator checked violation of competition in the music streaming and e-books markets where Apple works both as a distribution platform and application developer (European Commission, 2020). On the 30th of April, 2021 the European Commission preliminarily stated that Apple uses its dominance to give preferences to Apple Music over other competitors on the music streaming market (Mayo, 2021). The EU Commission notified Apple that from the regulator's point of view the company is violating competition law as a dominant player in the market of music streaming distribution. The Statement of objections is not the final outcome of the probe (European Commission, 2021).

In sum, Spotify vs Apple antitrust investigation:

- By the time of writing the paper it has already took over 2 years from filing the complaint to investigate the case. There is no legal deadline for the decision of antitrust regulation. It depends on complexity of the case; thus, the company can hardly predict period the case can be resolved (European Commission, 2020).

- Was filed in Spotify's home market, the EU - Sweden is a member of the EU.
- Led to cooperation of platform complementors against network orchestrator (e.g., Epic supported Spotify's actions), intensification of The Digital Markets Act development to regulate platforms on the EU territory (Stolton, 2021; The European Commission Digital Markets Act: A Translation, 2021; How the Digital Markets Act Can Tame Big Tech, 2021).

4. FURTHER RESEARCH

This section concludes the results of the analysis completed in the previous part of the paper. The initial hypothesis from the second part of the research are compared to the empirical evidence. The given part of the paper also provides managerial implications, states limitations of the current work and the used methodology and draws a path for future research.

4.1 Results and Hypothesis Testing

The analytical part and empirical data supported some of the abstracts from the theoretical part. By Nambisan et al. (2019) the new platform entrants need to cooperate with other contributors against hostile platform actions. Mobile application developers create organizations against app store terms, e.g., a Coalition for App Fairness. The Apple App Store builds and organizes the rules of participation on the platform – e.g., by app developer's guidelines. It supports the findings of Nambisan & Sawhney (2011). Orchestrator try to achieve standard contracts in the relationship with supply-chain members (Cafaggi, 2016; Jacobides et al., 2018). The survey and the list of Apple App Store guidelines reveal generalization of contracts between application store and third-party developers. In digital platforms, a leading downstream firm usually possesses more power, and strong value chain participants can renegotiate contract conditions unilaterally (Bacchiega et al., 2016). In 2011 Apple eliminated alternative in-app payment systems and prohibited the apps to show the users information about the existence of such options. It affected the developers, including Spotify (Timeline, 2021).

Downstream firms are capable of value appropriation (MacDonald & Ryall, 2004). In support of the first hypothesis, paid applications share 15-30% of their revenue with application stores. At the same time, they bear significant R&D, maintenance, and marketing expenses, sometimes driving their profit below zero. A theoretical model with gains and losses of distributing applications via application store and management questionnaire supported the second hypothesis. It stated that the preferable strategy of mobile app developers is to enter a global digital platform with strict contractual controls instead of not entering a market at all. If the app developer doesn't enter the platform, its economic profit is basically below zero. The third hypothesis that mobile apps suppliers can reduce contractual controls of platforms-monopolists by complaining to competition authorities is supported by empirical data. Kaspersky, Spotify, Epic Games filed antitrust complaints against Apple in various countries. By Avdasheva and Shastitko (2012), a successful decision of a regulator in one country increases chances of success in other regions. The questionnaire revealed that the managers would attract authorities of their home region. Kaspersky's product manager claimed that FAS, Kaspersky's home country antitrust regulator. The team of lawyers usually has more experience in the home market. Moreover, home country regulator is more loyal to a local firm. The results partly support the fourth hypothesis: when deciding which local competition authorities to attract, companies tend to file complaints in their home region.

The cases examination led to the following managerial recommendations:

1. App developers possess little bargaining power against app stores. They can negotiations with a platform holder, unite into groups of developers or get support from the authorities.
2. Weaker platform participants should lobby lawmakers and regulations authorities to improve platform regulation and update competition law to non-traditional industries.
3. Antitrust investigations on various markets might cost and last differently. It might be better for a developer to trigger competition authorities in the home region of the company. There are more chances of a positive decision of the regulator. After that, the firm might also file complaints to other more authoritative regulators in bid regions.

1.2 Research Limitations and Further Development of the Study

The research provides a complex study of mobile application industry specifics. The paper overviews the global value chain of mobile applications production and distribution, industry players, and their value division. A substantial part of the research is dedicated to the means of reducing contract pressure on application suppliers from the application stores side. However, there are possible gaps and opportunities for the future investigation of the topic:

1. A limited number of studies regarding the topic of the paper. The topic of means to increase the negotiation power of platform participants needs new frameworks and modeling.
2. A limited open-source data, e.g., most of the app developing companies are not public.
3. Limited case study sample of one digital platform and two markets.
4. Limited survey sample. 9 participants were managers of app developing companies.
5. The interview part consists of an interview with Kaspersky's product manager. The research can be improved by interviews with Spotify, Epic Games management.
6. With more data, managerial scenarios could be calculated based on the formalized model.
7. The research can be enriched by the development of the topic from the other sides of the industry: in addition to the application developers, platform and user position.

However, the current design of the study allowed the researchers to get conclusions that can be used by mobile app industry management. The results give instruments and sources for managers that consider the help of authorities in dealing with digital platforms on their contract terms and abusive practices.

5. CONCLUSION

The research provided a substantial array of theoretical and practical data concerning the global value chain of mobile applications. The work has a specific focus on the unexplored topic of the fostering bargaining power of mobile application developers in negotiation with platform holders. Usually, the optimal solution for an app developer is to enter a new platform with broad opportunities for app distribution. There, a platform complementor would encounter rigid and unified formal regulation and quality standards set by the Orchestrator.

Several possible solutions exist to advocate app suppliers' interests in the business network. They can seek the help of authorities and lobby their interests or try to protect their business by applying to existing regulation. In the situation of the absence of specific platform regulation, market participants can use the means of competition Law. Application developers usually distribute their services in several markets and can seek the support of competition authorities in different regions. However, home region regulators are often the most convenient starting point to apply to. Their decision might also become a positive case for a company to trigger investigations against a lead firm in other regions.

Cases of Kaspersky and Spotify complaining to competition authorities in Russia and the European Union shows that the antitrust investigation procedures, timing, and costs vary across the geographies. Based on the cases the research provides the analysis of antitrust investigation processes in Russia and the EU. Following the tested hypothesis, recent and planned changes in antitrust regulation in different regions, competition complaints against Apple in various jurisdictions the work offers managerial recommendations for mobile app developers. The findings can be useful for the firms that operate in adjacent industries and face contractual controls pressure from platforms.

It is important to take into consideration that the rigidity of antitrust authorities' solutions and consequences for the sides differ in the countries. There might be civil, administrative, and even criminal penalties for competition abuse for platforms in some regions. The influence of solutions of antitrust authorities on regulators from other countries is also different. Management of companies should make a careful and comprehensive study of all the inputs to choose the optimal instruments for strengthening a firm's bargaining power and decide on the region in case of claiming to antitrust authorities.