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## MOBILE ECOSYSTEMS: COMPETITION AND TRANSPARENCY

By Yusuke Zennyo

This article presents propositions about competition and transparency in the mobile ecosystem consisting of various submarkets. Facilitating competition is a major goal of competition policy. The view is stated herein not only for competition *within* individual submarkets of the mobile ecosystem, but also for competition *across* multiple submarkets. Moreover, the author insists on the importance of transparency in the ecosystem for better decision-making by involved parties therein, leading to the remarkable conclusion that enhancing transparency matters also in terms of cross-market competition. Transparency can facilitate cross-market competition between distinct platforms that have dominant power in their respective submarkets. Discussions are devoted mainly to two submarkets of the mobile ecosystem: the application (app) stores market and the mobile advertising market.

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# I. INTRODUCTION

Mobile ecosystems have become increasingly complicated, consisting of various submarkets such as mobile telecommunication, operating systems, device manufacturing, app stores, and digital advertising. These submarkets are closely connected because major players are active in several submarkets. Both Google and Apple are engaged in the development of mobile operating systems (Android OS and iOS), sales of smartphone devices (Pixel and iPhone), and operation of app stores (Play Store and App Store). Additionally, Google runs advertising intermediaries such as AdSense and AdMob. In contrast, although Apple earns advertising fees from application (app) developers to improve their search results in the App Store, it has currently run no intermediaries for in-app advertising since iAd was terminated in 2016.

Recent concerns related to competition policy mainly emphasize advertising and app stores. Concerns about digital advertising have been reported by competition authorities in Japan (Cabinet Secretariat, 2021),<sup>2</sup> the UK (Competition & Markets Authority, 2020),<sup>3</sup> and Australia (Australian Competition & Consumer Commission, 2021),<sup>4</sup> whereas app stores have been investigated by Dutch and UK authorities (Autoriteit Consument & Markt, 2019;<sup>5</sup> Competition & Markets Authority, 2021).<sup>6</sup> Both the advertising and app stores markets are also described in the Digital Market Act proposed by the European Commission in December 2020 (Digital Markets Act, 2020).<sup>7</sup>

A policy concern for the app stores market is the rise of their dominant market power. Because consumers are locked into an app store once they buy an Android or Apple device, Google and Apple behave as monopolistic gatekeepers to app developers for access to the user bases of their respective operating systems. Because of their gatekeeper position, they can charge a monopolistic 30 percent commission on app sales. Recently, pressure is growing for the app stores to reduce their commissions, as typified by the recent Epic Games lawsuit.

Also in mobile advertising, market concentration has come to pose difficulties. According to the reports produced in Japan, the UK, and Australia described above, Google holds a nearly monopolistic position. For example, Competition & Markets Authority (2020) estimated that at least 35 percent of the fees paid by advertisers are extracted by advertising intermediaries. In addition, some observers have warned of a lack of transparency in digital advertising (Cabral et al., 2021;<sup>8</sup> Jeon, 2021).<sup>9</sup> The market is so opaque that not all chains of payment can be followed. Invariably, some money is lost in calculation.

In Japan, the Act on Improving Transparency and Fairness of Digital Platforms began to be enforced on February 1, 2021. According to the Ministry of Economy, Trade and Industry (2021), “[the Act] adopts a ‘co-regulation’ approach that stipulates the general framework under laws and leaves details to businesses’ voluntary efforts.”<sup>10</sup> Two app stores (the Apple App Store and the Google Play Store) were selected as targets of the Act, in addition to three e-commerce platforms: Amazon.co.jp, Rakuten Ichiba, and Yahoo! Shopping. On June 18, 2021, the Cabinet approved the addition of the digital advertising market to the target of the Act. However, selection of specific target businesses has not yet taken place.

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2 Cabinet Secretariat, “Final Report on the Evaluation of Competition in the Digital Advertising Markets,” April 2021. Secretariat of the Headquarters for Digital Market Competition, Japan. Available at [https://www.kantei.go.jp/jp/singi/digitalmarket/kyosokaigi/dai5/siryou2\\_e.pdf](https://www.kantei.go.jp/jp/singi/digitalmarket/kyosokaigi/dai5/siryou2_e.pdf).

3 Competition & Markets Authority, “Online Platforms and Digital Advertising,” July 2020. Market Study Final Report. Available at <https://www.gov.uk/cma-cases/online-platforms-and-digital-advertising-market-study>.

4 Australian Competition & Consumer Commission, “Digital Advertising Services Inquiry,” January 2021. Interim Report. Available at <https://www.accc.gov.au/focus-areas/inquiries-finalised/digital-advertising-services-inquiry/interim-report>.

5 Autoriteit Consument & Markt, “Market Study into Mobile App Stores,” April 2019. Available at <https://www.acm.nl/en/publications/acm-launches-investigation-abuse-dominance-apple-its-app-store>.

6 Competition & Markets Authority, “Mobile Ecosystems,” December 2021. Market Study Interim Report. Available at <https://www.gov.uk/government/publications/mobile-ecosystems-market-study-interim-report>.

7 Digital Markets Act, “Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Contestable and Fair Markets in the Digital Sector,” 2020. Available at <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=COM:2020:842:FIN>.

8 Cabral, Luis, Justus Haucap, Geoffrey Parker, Georgios Petropoulos, Tommaso Valletti, & Marchall Van Alstyne, “The EU Digital Markets Act: A Report from a Panel of Economic Experts,” July 2021. Publications Office of the European Union. Available at <https://publications.jrc.ec.europa.eu/repository/handle/JRC122910>.

9 Jeon, Doh-Shin, “Market Power and Transparency in Open Display Advertising — A Case Study,” 2021. Expert Group for the EU Observatory on the Online Platform Economy: Final reports.

10 Ministry of Economy, Trade and Industry, “Key Points of the Act on Improving Transparency and Fairness of Digital Platforms,” 2021. Digital Market Policy Office, Information Economy Division, Commerce and Information Policy Bureau, Japan. Available at [https://www.meti.go.jp/english/policy/mono\\_info\\_service/information\\_economy/digital\\_platforms/tfdpa.html](https://www.meti.go.jp/english/policy/mono_info_service/information_economy/digital_platforms/tfdpa.html).

Mobile apps play a crucially important role in both advertising and app stores markets. Broadly speaking, app developers have two revenue channels, app sales and in-app advertising, both of which are driven by distinct platforms. The former is operated by app stores such as Apple App Store and Google Play Store, where developers can sell their apps to users. The latter revenue channel is facilitated by advertising intermediaries (also called ad tech and ad exchange), enabling app developers to sell their ad inventory to advertisers through real-time auctions. Platform intermediaries of different kinds support app developers in monetizing their apps. Hereinafter, the terms “app-platform market” and “ad-platform market” are used to denote those platform markets, respectively.

The remainder of this article is dedicated to providing a comprehensive view of the mobile ecosystem across both the app-platform and ad-platform markets. In Section II, not only competition *within* each of the two submarkets but also competition *across* them is discussed, with consideration of the presence of network externalities. Section III specifically examines how important enhancing market transparency is for building desirable competitive environments in the mobile ecosystem.

## II. COMPETITION

Competition is usually perceived as desirable from policy perspectives. Competition usually incentivizes firms to lower prices to attract consumers from rivals. Nevertheless, if a few firms have dominant power in a market, then they can exercise it to charge high prices. High prices reduce the total quantity traded in the market, thereby creating a deadweight loss. Increasing the number of competitors is expected to enhance both consumer welfare and social welfare.

The desirability of competition is not necessarily the case in markets with network externalities among consumers. Tirole (1988, p. 405) describes that “[p]ositive network externalities arise when a good is more valuable to a user the more users adopt the same good of compatible ones.”<sup>11</sup> Market concentration to a monopoly firm might enable the formation of a huge network, through which consumers can enjoy large network benefits. The same applies to cross-side network externalities in two-sided platforms. Regarding an app store as an example, an increase in the number of users participating in the app store raises the expected profit of app developers; then it facilitates the increased entry of apps into the app store. The increased entry of apps can attract more users to participate in the app store to purchase apps. A positive feedback loop between the two sides of the app platform matters not only for the platform itself but also for the participants (i.e. users and developers of apps).

Greater competition associated with an increased number of competing platforms might divide participants into small networks, which hinders them from enjoying large network benefits. When losses from the shrinking network size become greater than the benefit associated with the reduction in price, enhancing platform competition might be detrimental to participants (Tan & Zhou, 2021).<sup>12</sup> Additionally, market segmentation might increase users’ costs for seeking apps and developers’ costs for listing on multiple app stores, as has actually occurred in China’s Android OS ecosystem (Cabral et al., 2021).<sup>13</sup> Prohibition of Google’s Play Store has caused the emergence of many competing app stores, leading to proliferation of numerous low-quality apps in the mobile ecosystem.

Competition not only occurs in individual markets. It also takes place across multiple markets. In the mobile ecosystem, cross-market competition occurs between app-platform and ad-platform markets (Zenny, 2021).<sup>14</sup> App platforms and ad platforms compete in commission to attract app developers’ revenue sources. Developers decide, after observing app commissions and ad commissions, through which mode to earn revenues. Some rely on revenue from selling apps (e.g. pay-per-download fee, subscription fee, and in-app purchasing), with part of that revenue paid for the app platform’s commission. Other developers earn revenue from in-app advertising through matching services provided by ad platforms. A percentage of the fees paid by advertisers is collected by the ad platforms as commission. Cross-market platform competition occurs because, for example, a reduction in app commissions (or an increase in ad commissions) will encourage more developers to rely on the sales of apps rather than relying on in-app advertising, which can increase the commission revenue of the app platform at the expense of ad platforms.

Even if each submarket is highly concentrated or monopolized, the presence of cross-market competition is expected to inhibit the exercise of dominant market power while not reducing the benefits from the formation of large networks. In the current state of mobile ecosystem,

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11 Tirole, Jean, “*The Theory of Industrial Organization*,” MIT Press, 1988.

12 Tan, Guofu and Junjie Zhou, “The Effects of Competition and Entry in Multi-sided Markets,” *Review of Economic Studies*, 2021, 88 (2), 1002–1030.

13 Cabral, Luis, Justus Haucap, Geoffrey Parker, Georgios Petropoulos, Tommaso Valletti, and Marchall Van Alstyne, “The EU Digital Markets Act: A Report from a Panel of Economic Experts,” July 2021. Publications Office of the European Union. Available at <https://publications.jrc.ec.europa.eu/repository/handle/JRC122910>.

14 Zenny, Yusuke, “Cross-Market Platform Competition in Mobile App Economy,” CPRC Discussion Paper Series, 2021, CPDP-83-E.

as described in Section I, market concentration has been a policy concern in both app-platform and ad-platform markets. This concern can be resolved when cross-market competition between them takes place in a preferred manner. This approach is expected to have some advantages over one that pursues promotion of within-market competition because a large network becomes constructed in each submarket.

The preceding discussions suggest the necessity of looking at competition in mobile ecosystems from a more pluralistic view, to some degree. However, that has yet to be accomplished because policy debates for app-platform and ad-platform markets have been made completely separately. There might be room for argument about cross-market platform competition.

### III. TRANSPARENCY

Market transparency is fundamentally important to enable better decision-making by parties involved in the market. In opaque market environments, they are forced to make decisions based on limited information. In the context of cross-market platform competition in the mobile ecosystem, the lack of transparency in mobile advertising might lead app developers to make an incorrect decision that they would never select with full information. For example, a developer who should have chosen to earn from the sale of apps might choose to rely on in-app advertising. Such wrong choices about business models might actually be occurring.

Recently, there is a growing pressure on app stores for reduction of their commissions, as exemplified by the backlash by Epic Games to Apple in August 2020. In response, on January 1, 2021, Apple reduced its commission from 30 to 15 percent for app developers whose annual sales were less than USD 1 million. Subsequently, Google followed its rival by reducing the commission to 15 percent for the first USD 1 million of revenue that developers earn each year.

Although antitrust lawsuits by major app developers such as Epic Games and Spotify have added fuel to the flames, the 30 percent commission has actually been paid only by a minority of app developers. According to a report by Statista Inc. (2021), 93.4 percent of iOS apps and 96.9 percent of Android apps were delivered free of charge as of July 2021.<sup>15</sup> Instead, they earn revenues from in-app advertising, which is not subject to the payment of commission to app stores. In other words, app stores receive no commissions for their intermediation services from approximately 95 percent of app developers.

Why do most app developers rely on in-app advertising? Are ad commissions low? That does not seem correct because Competition & Markets Authority (2020) estimated that the actual ad commission is, on average, at least 35 percent, which is higher than the 15–30 percent of the app commission. Australian Competition & Consumer Commission (2021) has also reported a similar estimation result that 28 percent of advertiser expenditures are captured by ad tech services in Australia. The 28–35 percent commission might not be sufficiently low to explain the very high adoption rate of in-app advertising among app developers.

Market opacity could be a reason for this phenomenon. As Cabral et al. (2021) pointed out, not all chains of payments in advertising intermediaries can be followed. Some money is “lost” in calculation.<sup>16</sup> More problematically, in most cases, app developers do not know who paid how much for their ad space. It remains possible that in-app advertising is a much more efficient means of monetization for developers than the sale of apps, even if they must pay the 28–35 percent commission. Even if true, the lack of transparency presents a special difficulty in itself, which should be addressed as soon as possible.

Enhancing transparency in the advertising market is expected to support app developers in their decision-making, especially in business model choices. Currently, a vast majority of mobile apps deploy an ad-funded business model, which exposes users to a storm of advertisements (i.e. ad creep). Such advertisements are often uninformative and annoying, generating disutility to users, on average (Ghose & Han, 2014).<sup>17</sup> Although recent technological advances have enabled personalized and targeted advertising, they create a different difficulty related to the abuse of user privacy (e.g. Goldfarb & Tucker, 2012).<sup>18</sup> Excessive ad creep might be associated with the lack of transparency of the advertising market.

15 Statista Inc., “Distribution of Free and Paid Apps in the Apple App Store and Google Play as of July 2021,” 2021. Available at <https://www.statista.com/statistics/263797/number-of-applications-for-mobile-phones/> Retrieved on January 28, 2022.

16 Cabral, Luis, Justus Haucap, Geoffrey Parker, Georgios Petropoulos, Tommaso Valletti, and Marchall Van Alstyne, “The EU Digital Markets Act: A Report from a Panel of Economic Experts,” July 2021. Publications Office of the European Union. Available at <https://publications.jrc.ec.europa.eu/repository/handle/JRC122910>.

17 Ghose, Anindya & Sang Pil Han, “Estimating Demand for Mobile Applications in the New Economy,” *Management Science*, 2014, 60 (6), 1470–1488.

18 Goldfarb, Avi & Catherine Tucker, “Shifts in Privacy Concerns,” *American Economic Review*, 2012, 102 (3), 349–353.

Transparency in the advertising market might bring another benefit. It can enhance cross-market platform competition between app platforms and ad platforms. Even if a few platforms dominate each of the two submarkets, cross-market competition can be promoted between those dominant platforms. To achieve it, market opacity might be a drag. Ensuring transparency enables app developers to make better decisions about their business model, which can in turn enhance cross-market platform competition. Therefore, the issue of increasing transparency is associated with the promotion of cross-market platform competition.

## IV. CONCLUSION

In this article, competition and transparency in mobile ecosystems are discussed. Not only competition within individual submarkets but also competition across multiple submarkets should be considered because of the close connection among submarkets in the ecosystem. Especially, this article specifically emphasizes cross-market platform competition between app-platform and ad-platform markets. A possible policy direction is to allow market dominance within each of the submarkets for purposes of expanding network externalities while facilitating cross-market competition between those dominant platforms.

Toward this end, ensuring market transparency in mobile ecosystems also matters. Currently, concerns about the opacity of advertising markets have been raised around the globe. Especially, this article raises concerns about advertising opacity distorting app developers' business model choices. Wrong decision-making associated with market opacity can be expected to impede the promotion of cross-market platform competition. Two issues should be addressed in a coordinated manner: promotion of cross-market competition and enhancement of advertising transparency.



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