

Regulatory concerns over the mobile OS in-app purchase policy

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Abstract

As app stores grow rapidly, the bottleneck phenomenon of platforms may trigger serious regulatory concerns. This paper aims to investigate the in-app purchase (IAP) policy of Apple in terms of platform competition in a two-sided market with multihoming. Application markets as a typical meta platform are leading new mobile ecosystem platforms as they provide the vehicle for diverse components to get together. Apple's in-app purchase policy is not favorable for developers. Apple takes 30% of sales price as a transaction fee. But both developers and consumers are not locked-in. Some developers move to mobile web app(html 5) while others integrate with hardware manufacturer to sell their contents without accessing the app store. Effective competition in the app market is working with multihoming. Consumers also multihome to other Android OS using multiple mobile devices. ICT platform markets have dynamic and complex nature and new firms enter the mobile platform market continuously. Therefore, it is not appropriate to regulate the in-app purchase policy, though some regulatory concerns are raised. However mobile platform operators should lower the entry barrier to developers and make ecosystem more productive. They have to protect both developers' right and consumers' right to induce them to the store. Mobile platform with multi-sided markets should seek the way to enhance users' welfare as well as dynamic efficiency in the market by innovation of technology and product differentiation.

Keywords: platform neutrality, multi-homing, anticompetitive behavior, transaction fee

1. Introduction

Mobile web traffic has surpassed that of desktop since smartphone devices have been introduced. Some research results show that 77% of smartphone users access an app store while usage rate of web browsing is only 12%. Google has reached out to the mobile market in order to look for new engines of growth. Already well-known for its comprehensive competitiveness of search engines, Google has tried to leverage the competitive advantage of the web in related mobile services. The most representative service Google developed is an operating system called Chrome that is derived from its browser technology and designed to run on only web-based software. As a result, despite Microsoft Internet Explorer's dominance in the web browser market for years, Google's Chrome has become the most-used web browser according to the data from website analytics company StatCounter. Chrome occupies 33% of the global market, Internet Explorer 32%, and Firefox 25%. In the mobile OS platform market, Android has 51% of U.S. market share while iOS of Apple has only 34% market share. In the domestic market, market share of iOS has fallen from 31% in 2010 to 12.1% in 2012 (Lee, 2012). Apple has continuously developed several competitive platforms such as iTunes, iOS, App Store and

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** This paper was partially supported by Seoul National University of Science and Technology (2012).

enhanced the competitive advantages of digital devices making use of the platforms and now has vertically integrated hardware-software system.

The convergence between IT, the Internet, telecommunications, and media services and technologies results in an unbundled, open marketplace in which competition will flourish (Ballon, 2009). West (2003) confirmed that leading ICT firms are increasingly opting for hybrid, 'open but not open' strategies that attempt to combine the advantages of open technology development while retaining the ability to control and differentiate. In the mobile ecosystem, platform can be a source which can generate market power and create a very important starting point of leveraging the power into the related area in the competitive environment. In the ICT ecosystem, platforms arise as central components that enable their owners to operate as gatekeepers of information and value flow.

Multiple jurisdictions in the European Community and the United States have claimed that Apple and Google have violated the competition laws by leveraging their market power and limiting the ability of their competitors by showing some exclusive behaviors. The regulatory authorities of many countries began to scrutinize the Internet economy and many competition issues are being considered by policymakers.

Either App Store (Apple) or Google Play (Google) is a marketplace where buyers and sellers of apps meet and make transactions. The market share of Android OS is bigger than that of Apple iOS in the global market, but iOS app store has been evaluated to have more influential power for app developers than Google Play. Regulatory concern over Apple's App Store policy is triggered by Apple's in-app purchase policy of Review Guidelines revised in 2011. The revised clause includes that all the contents and applications should be offered through Apple's in-app purchase system and they get 30% transaction fee from the developers. Furthermore, prices should be equal to or less than those of the identical item outside the app store such as the developer's website and buttons or links to purchase content in any other way are not allowed.¹⁾ Regarding this clause, there are arguments if 30% transaction fee policy is anti-competitive and can exclude small companies that rely on a margin of profit below 30%, like e-book sellers and music subscriptions services, from using Apple's in-app purchase system. Match.com's iPhone app was pulled from the App Store for allowing users to pay for a match.com subscription using an external line instead of the in-app purchasing system that Apple has in place.²⁾

Some competition authorities raised regulatory concerns since this policy may hinder app developers from developing a new business model. Apple still prohibits anyone from providing a buy button or even a link from apps to bring up Safari in any convenient way to purchase content. Upon the strong argument from developers, the Section 11.3 has now been revised to allow publishers to sell their content out of the App Store. Apple will not receive any portion of the revenues for approved content that is subscribed to or purchased outside of the app. However, publishers still can't include a link or button in their apps that send the user to a web site where they can conduct a transaction. Another controversy was raised with regard to the app store review guidelines recently. Newly updated Apple's app store review guidelines include a new clause (Section 2.25)³⁾ that could restrict either the app's advertisement or promotion of other apps, which attracts users' attention for developers, making cross-promotion marketing strategy very popular. However if cross-promotion between apps are allowed using illegal services, Apple thinks that it is possible to manipulate the app store ranking. Applied to Korean app market, the service of ame which Kakao-talk is providing can be hindered by this clause.⁴⁾

As the app stores grow rapidly, the bottleneck of platforms may trigger serious regulatory concerns but it

1) the App Store Review Guidelines

2) Wired, 2012. 2. 11 Match.com iPhone App Pulled for Skirting In-App Purchasing Policy

3) Section 2.25 says that apps that display apps other than your own for purchase or promotion in a manner similar to or confusing with the App Store will be rejected.

4) etoday, 2012. 10. 19

is not easy to regulate platform operator for a number of reasons. Therefore this paper aims to investigate the in-app purchase policy of the app stores run by Apple and Google based on the literature on platform competition in two-sided markets with multihoming. App store is a typical two-sided market in which both developers and consumers can multihome. To regulate the platform providers to accept the neutrality regulations, the economic characteristics of two-sided market with multihoming should be understood. The cases analyzed in the paper have important implications for the recent antitrust issue raised by competitors in ICT industries where multihoming is prevalent.

2. Some theoretical discussion on the platform competition

2.1 The concept of ICT platform

The meaning of platform is varied according to how to define the concept. Technically, an ICT platform may refer to a hardware configuration, an operating system, a software framework or any other common entity on which a number of associated components or services run. It encompasses mobile OS, applications market, advertising platform, social network service, and mobile messaging service. Economically, platforms and their providers mediate and coordinate between various stakeholder constituencies (Ballon & Heesvelde, 2011). Lee (2011) defined platform as the basic structure which is used to produce and sell a number of products such as automobile and electronic devices. Also platform is referred to as the infrastructure in which the transaction of products and the development of applied programs can be made, such as online shopping mall, operating system and applications store. In summary, platform mediates the transaction of applications and digital contents and enables them to run and use.

ICT platforms have interchangeable components, so that many buyers can share the benefits of the same technical advance, introducing network effects into the economics of ICT platforms (Ballon & Heesvelde, 2011). Platform operators can analyze the consumer needs quickly and correspond to them pertinently. Platform with the large subscriber base has network externalities to extend its influential power to related markets. The representative examples of platform are (1) mobile OS, (2) application stores, (3) social network service (SNS), and (4) ecosystem (Gong, 2011).

Platform owners play a role of platform gatekeeper, controlling access in modular or partly-modular systems. This notion of gatekeeper includes that gatekeepers not only filter and select information but also qualitatively alter the informational content through active accumulation, processing and packaging. Therefore, the platform providers gather specific information and then process and filter within the value network.

It can be summarized that platform leaders have built a business model around a set of crucial gatekeeper roles that help them to exercise a form of control over the wider value network, and to add and capture significant value in the process (Ballon & Heesvelde, 2011).

2.2 A typology of ICT platform business models

Platform markets are far more complex than mere access markets. The bundling of services, the employment of cross subsidies, and temporary selling below cost at one side of the market may be acceptable, as they may lead to consumer surplus in the long term (Ballon & Heesvelde, 2011). Flexibility and scalability are very important in a system based on a platform (Kim, 2011).

In the transaction platform, core functions of platform comprise of technology system and are supported by several kinds of complementers. For instance, Apple iPhone needs app development, voice cognition, wireless

technology as well as iOS. The platform provides the attractive economic incentives to induce the participation of complementers. To extend the market power of a specific platform, it must maximize the network externalities.

There are different types of ICT platforms in the market, employing different business models and different forms of control. Platform may differ fundamentally both in terms of the set of additional roles and in terms of how they interact with customers at multiple sides of the platform. Types of platforms are classified according to the standard whether control over assets is linked to control over customers, that is, (1) neutral platform, (2) broker platform, (3) enabler platform, and (4) system integrator platform.

First, 'Neutral Platform' refers to a case in which the platform owner does not control most of the assets necessary for the value position. Second, 'Broker Platform' relies on other actors that control most of assets for establishing the value proposition, but does integrate customer ownership. The third type of platform is 'Enabler Platform'. The owner of this kind of platform controls most of the assets involved in service provision but leaves the customer relationship to third-party developers. The last one is a 'System Integrator Platform'. This represents the case where many or most of the assets are in the hands of the platform owner as well as the customer ownership. This type of platform facilitates and encourages entry of third parties to constitute a multi-sided market by not squeezing complementary actors out of the market. This allows competing service providers to use their platforms in order to increase the value of both platform and its own end-user service offering like the Apple iPhone (Ballon & Heesvelde, 2011). Table 1 includes the typical examples of platform types.

2.3 Two-sided market of ICT platform

Platforms are mediating entities between agents and operate on different sides of the market, and their utility is affected by participation and usage on the opposite side (Armstrong, 2006; Rochet & Tirole, 2003).

A multi-sided platform provides goods or services to two or more distinct groups of customers who need each other in some ways and who rely on the platform to intermediate transactions between them (Evans, 2003; Rochet & Tirole, 2003). Multi-sided platforms usually perform interrelated core functions to some degree. Multi-sided platforms usually lower transaction costs and thereby facilitate value-creating exchanges. A platform coordinates interactions between two or more distinct groups of stakeholders and is able to internalize the externalities created by one group for the other group. Business models in the multi-sided platform market do not aim to maximize the profit in a single market, and instead focus on balancing interests between the various stakeholders with single or multihoming of customers because the pricing strategy in a multi-sided market comprises subsidizing one side to attract customers on the other (Ballon & Heesvelde, 2011).

Another key feature of multi-sided platforms is the presence of the indirect network effects. That is, the value that a customer on one side realized from the platform increases with the number of customers on the other side (Evans, 2008). Another critical feature is that multi-sided platforms must cater to multiple, distinct customer groups simultaneously. A firm operating this kind of platform must consider the demands of all sides, the interrelationships between these demands, the costs directly attributable to each side, and the costs of running the platform. Many multi-sided platforms make their money from one side and make access to the platform available to another side for a price that does not cover the cost of provision (Evans & Schmalensee, 2007). The exclusive behaviors service provider use are such as standardization, differentiation, bundling, tying, or free trial. In addition, in the multi-sided platform, the third party plays a critical role as well as provider and users. The third party may be advertisers, content producers, app developers, or aggregators of other contents.

Therefore, ICT platform markets have dynamic and complex nature of competition among a large number

of platforms. In addition, in the ICT industry, controlling a platform in the economic sense is commonly associated with controlling a platform in the technological sense, i.e. a hardware configuration, an operating system, a software framework or any other common entity on which a number of associated components or services run (Ballon & Heesvelde, 2011). Platforms which have been originated in entirely different sectors compete directly against each other in a new ecosystem.

Google's search platform is one of typical multi-sided platforms. Google's search platform serves people who search the web, advertisers who want to reach these users, and application developers who use Google's software to develop complementary products (Evans, 2008). The search engine also helps people find web-based businesses. The content is usually made available for free so that advertising is the primary source of revenue and profits. Google also makes its popular mapping software available to developers who write applications. The more valuable complementary products and services, the more valuable the web platform becomes, which in turn helps drive revenues (Evans, 2008).

2.4 Multihoming

In most markets with platform competition, consumers have the option to purchase on multiple platforms (multihoming) and firms have the option to produce for multiple firms (multi-production).

In the multi-sided platforms, it is very important for involved firm or consumers to be able to single-home or multi-home. Most two-sided markets appear to have several competing two-sided firms and at least one side appears to multihome (Evans, 2003).

Carrillo & Tan (2006) suggested the model of platform competition in which two firms offer horizontally differentiated platforms and a group of complementers offers products that are complementary to each platform. Consumers can buy from either or both platforms (single- or multi-homing) and complementers can produce for either or both platforms (single or multi-production). In equilibrium, consumers are more likely to multihome as the level of differentiation of platforms decreases or as the number of complementers for either platform increases. The platform and its complementers always benefit from an increase in the number of complementers in their platform.

A platform becomes more attractive to consumers as the number of its complementers increases. The value of a platform for one side of the market increases with the number of players in the other side of the market that adhere to it (Armstrong, 2006; Rochet & Tirole, 2005). Because of this externality, optimal price-setting by platforms requires cross-subsidization. Optimal pricing structure in two different regimes depends on whether consumers single-home or multi-home.

Also consumers are more likely to single-home as the level of differentiation of platform increases. Under single-homing, a platform is more valuable to consumers as the number of its complementers relative to the complementers in the other platform increases. Higher value means possibility to charge higher prices while keeping consumers loyalty.

In a market without product differentiation, it may be an irrelevant option for consumers to buy from both firms. It is a more rational behavior to single-home (Doganoglu & Wright, 2006). Doganoglu & Wright (2006) focus on whether multihoming by consumers reduces the need to make products compatible in order for consumers to enjoy network benefits. They find that multihoming weakens competition and makes compatibility less attractive to the firms, but increases the social desirability of compatibility.

In other network markets such as payment systems, game platforms, and instant messaging services, there seems to be no consideration of network compatibility due to the presence of widespread multihoming in these markets.

DePalma et al. (1999) show that consumers can always reap the benefits of compatibility by joining both networks and double purchases drastically affect the nature of the product market equilibrium as well as compatibility choices made by the firms. There is also quantity competition between two firms in which consumers are heterogeneous with respect to network benefits.

Doganoglu & Wright (2006) suggest that the presence of widespread multihoming is not a justification for ignoring the issue of compatibility. Multihoming is not always a good substitute for compatibility. With multihoming, the network externality can be weakened since users can choose competitive service. Thus, firms are less likely to choose to become compatible. In the absence of multihoming, firms have excessive incentives to choose compatibility. Firms will sometimes choose compatibility even though it is not socially desirable. When consumers can multihome, some consumers buy twice, increasing each firm's total sales. This provides firms with an incentive to remain incompatible. The fact that some consumers buy both products means that the consumer expectations are less sensitive to price changes.

Mital & Sarkar (2011) investigated the multihoming behavior of users on social networking web sites in the absence or the presence of product differentiation. Under multihoming without product differentiation, all members of the smaller network multihome to the bigger network and the social networking web site with the bigger network size benefits from multihoming. Under multihoming with product differentiation, when the smaller network differentiates its product from the bigger network, all members of the bigger network will multihome to the smaller network. Multihoming results increased utility for the users of social networking web sites when two products were differentiated in terms of features.

Typical examples of platform competition with complements include IT industries. Leading web platforms will face complaints over tying of various forms. They can lower marginal costs for tying and obtain efficiencies by integrating features together or making it easier for consumers to obtain them more conveniently, and they can aggregate demand over users who may value one feature but not another (Evans, Hagiu & Schmalensee, 2006). Choi (2010) analyzed the effects of tying on market competition and found that tying induces more consumers to multihome and makes platform-specific exclusive content available to more consumers, which is beneficial to content providers. Tying can enhance if consumers can multihome. As a result, tying can be welfare-enhancing if multihoming is allowed.

3. Regulatory concerns over bottleneck characteristics of platform

3.1 Platform neutrality

As the functions of network and platform begin to separate rapidly, thanks to technology innovation, the control power of telecommunication companies have become weak (Kim, 2010). The activation of smartphone mobile services by direct interaction between users and contents/applications gives platform operators to perform bottleneck function. Smart devices enable consumers to choose and install diverse applications freely, so they gain influence on selecting applications depending on the characteristics of platform. Some studies explain platforms applying concept of bottleneck and define bottlenecks in a strategic way as segments where mobility is limited and competition is softened. In this context, platform neutrality can be an important fair competition issue.

Basically the concept of 'neutrality' aims to guarantee freedom to access contents, freedom to use applications, freedom to attach personal devices, and freedom to obtain information (Lee & Song, 2011). That is, platform neutrality means a series of regulatory policy initiatives against platform operator that impose the fair access obligations for market dominant operators, which have the potential abilities and incentives to harm

the fair competition by discriminating and controlling of contents, applications, and devices. Those regulations are applied to the broadband service provider.

However, since most platforms have multi-sided markets, different frameworks of analysis should be applied specifically for multi-sided markets. In the multi-sided markets, the framework of fair competition is totally different in the case of defining relevant market, judging the significant market power, and measuring economic efficiency (Hesse, 2007).

Boudreau (2005) argues that real-life platforms exhibit strong heterogeneity in terms of the configuration of components and boundaries, and in terms of integration and compatibility strategies, of revenue sharing models and even in terms of the associated regulatory concerns. Boundaries of platforms are changing and there are different types of platform business models, therefore the levels of integration and control vary.

3.2 Platform-related regulatory concerns according to the types of platforms

Competition authorities worry when firm's behaviors are anti-competitive such as reducing the rivals' sales, thereby foreclosing them from the market. However, competition authorities have difficulty in distinguishing pro-competitive from anti-competitive business practices for multi-sided platforms.

Table 1. Platform-related regulatory concerns according to the types of platform

	No control over customers	Control over customers
No control over assets	Neutral Platform	Broker Platform
	The platform owner is strongly reliant on the assets of other actors to create the value proposition, and does not control the customer relationship.	The platform owner is strongly reliant on the assets of other actors to create the value proposition, but does control the customer relationship.
	Google search, Paypal	Facebook, eBay
	Regulatory concerns; – no specific concerns	Regulatory concerns: – Customer lock-in (raising switching costs) – Price squeeze of service/content providers
Control over assets	Enabler Platform	System Integrator Platform
	The platform owner controls many of the necessary assets to ensure the value proposition, but does not control the customer relationship.	The platform owner controls many of the assets to ensure the value proposition, and establishes a relationship with end-users. Entry of 'third-party' service providers is actively encouraged.
	Intel, IMS	Apple iPhone, Microsoft OS
	Regulatory concerns: – Refusal to deal – Strategic design of products (interoperability)	Regulatory concerns: – Customer lock-in (raising switching costs) – Price squeeze of service/content providers – Refusal to deal – Strategic design of products (interoperability) – Lock-in of service/content providers – Cross-subsidization

Source: Ballon & Heesvelde (2011)

Table 1 shows a number of scenarios related to the specific platform-related concerns which each type of

platform may bring about. The platform typology is based on the distinction between having control or not over the customer relationship, and having control or not over many or most of the assets to ensure the overall value proposition (Ballon & Heesvelde, 2011). While every platform may have dominance within the market where it is primarily active, not all types that we distinguish are as likely to bring about risks related to market distortion and abuse in complementary markets.

The neutral platform is unlikely to be sufficiently dominant to lead to strong anti-competitive risks at either side of the platform. Google may be the best example of such platform. However, Google's extension of the platforms which it operates probably requires the company to be classified as another type of platform. Google had its search engine-focused business model at first but has continuously extended the platforms which it operates (e.g. Chrome, Android) and the end-user services which it offers (e.g. Gmail, Google Voice). This is the reason regulators should monitor the market dynamics on a regular basis.

The broker platform entails some risks related to its control over the customer relationship. These include customer lock-in and overcharging service/content providers. The enabler platform may include some issues such as refusal to deal. Lastly, the system integrator platform naturally combines the potential concerns of the other types, and in addition may give rise to specific cross-subsidization concerns (Ballon & Heesvelde, 2011).

The characteristics of platforms also provide a number of reasons to mitigate concerns and intervention. The specific nature of platforms implies that many traditional suspicions against firms setting non-cost based prices, introducing cross-subsidies and engaging in collaborations to set a de facto industry standard lose their validity in a multi-sided market context. Lee & Song (2011) examines the applicability of mobile platform neutrality, focusing on the tying behavior of Google search application with Android OS platform and its effects on the fair competition and users' welfare in the mobile contents/applications market. The result shows that it is not appropriate to regulate tying behavior of Google and apply platform neutrality at the present because the mobile OS market is very competitive and system competition is making rapid progress. Since the mobile platform has the typical characteristics of two-sided market, Google's effort to enlarge the mobile advertisement revenue based on the network effect of mobile platform and search application should be regarded as a rational strategy (Lee & Song, 2011).

The assessment of whether a market functions well or not is again based on the competition rules. There are three criteria: high and contemporary barriers to entry in a market; the dynamic state of competition behind these barriers to entry; and the question of whether existing competition law is sufficient or not. If ex ante regulation is to be justified, there should be robust high entry barriers. The most important remedies are transparency, non-discrimination, accounting separation, co-location and facility sharing, technical standards, price control, cost orientation, and publication and access to information (Ballon & Heesvelde, 2011).

4. Discussion on mobile OS platform operator's in-app purchase policy

This paper examines the mobile OS platform operator's in-app purchase policy. While Google and Apple made their own app store review guidelines, some of the clauses raise controversial antitrust issues. Anti-competitive effects caused by the clauses will be discussed in the next section.

4.1 App store review guidelines: in-app purchase policy

Apple has played a leading role in making strict in-app purchase policy. Apple has applied the original strategy to integrate OS, app store and hardware, and leads the market with its own mobile digital devices.

Any developer who wants to distribute products in the app store should be registered and approved by the store operator and follow the terms of the agreement. The agreement covers both products for free and products charging a fee. In order for developers to charge a fee for the products, they must have a valid payment account.

Developer may choose to distribute applications for free or not. If the application is free, they are not charged a transaction fee. Instead, they can collect complementary charges like ads from users for copies of the products that those users were initially allowed to download for free. If developers want to collect fees after the free trial expires, they must collect all fees for the full version of the product through the payment processor on the market.⁵⁾

Controversial clauses are in the section about using in-app purchase system requirement and the amount of transaction fee.

- Section 11.2: Apps utilizing a system other than the in-app purchase API (IAP) to purchase content, functionality, or services in an app will be rejected.
- Section 11.3: Apps using IAP to purchase physical goods or goods and services used outside of the application will be rejected.

Section 11.2 has been changed partly after the resistance from developers; now developers can set different price outside the app now. But section 11.3 is still valid.

Another critical matter is transaction fee decided by Apple. Transaction fee is charged on the sales price. For all the applications that developers sell in the Apple app store, the transaction fee is equivalent to 30% of the application price. This rule is applied to all kinds of transaction made in app.

Table 2. In-app purchase rules adopted by app stores

App market	Key points
Olleh market	Recently changed the way of payment Payment by credit card not allowed, only payment by mobile phone allowed
T-Store	Should follow T-Store payment process Payment by credit card not allowed, only payment by mobile phone allowed Filter and inspect apps in T-store
Google Play	Set the price in native currency Charge the payment through telecommunication fares
Samsung Apps	Withdraw from telecommunication app market Filter and inspect apps in Samsung app store
Apple App Store	Leading in-app purchase policy Prohibit cross-promotion strategy in-app

The app markets operated by telecommunication companies recently changed the payment method. Payment by credit card is not allowed but they only accept payment by mobile phone. Amount of transaction fee is the same across all app stores except Google Play (e.g. T-store, Samsung apps, Olleh market). Google adopts differentiated policy and it returns the remaining 30% to payment processor and the distribution partner.⁶⁾ Apple takes 30% transaction fee of sales to share the revenues with developers while Google gives 70% of sales

5) Google Play's application review guidelines

6) Also developers may set the price for the products in the currencies permitted by the payment processor and the market may display to users the price of products in their native currency in Google Play.

price to developers and apportion the rest 30% to payment processor and telecommunication companies. It is part of the Google's strategy to expand the reach of Android OS.

Developers who operate on a small scale claim that they cannot develop an innovative business model due to high transaction fee and this rule forced them to bypass in-app purchase.

Newly updated clause of Apple's app review guidelines also raises controversy. According to Section 2.25, apps that display other apps for purchase or promotion in a manner similar to or confusing with the app store will be rejected. Apple said that this rule is made only for those apps for promotion of other apps, but this rule may affect developers who make many related apps.

4.2 Developers' responding strategies

Developers who sell their application in the Apple App Store adopt different responding strategies considering their advantageous part and business models.

Table 3. Responding strategies of app developers

Category	Responding strategies
Global contents providers (Amazon, Barnes & Noble, Facebook)	Launch its own mobile web service (html 5) Develop its own tablet PC
Local contents providers based on web site (broadcasters, contents aggregators)	Delete the button of buy, bypassing IAP policy induce users to pay in web site
Large-scale contents provider based on only one app (KAKAO, mobile game)	Accept the rules
Small-scale app provider based on only one app (dice player)	Offer their apps for free Instead adopt a new business model (donation, advertising)

In the first stage, content providers who had powerful competitive contents archive withdrew from the Apple and moved to mobile web. Amazon and Barnes & Noble are typical examples of this category. They withdrew their apps from the Apple App Store immediately after announcement of new in-app purchase policy and developed their own tablet PCs, named as "Kindle Fire" and "Nook" respectively. Amazon does not have its own mobile operating system but instead has comprehensive contents archive which includes 1 million e-books, 100,000 DVD titles, and 17 million music clips. Moreover, since Amazon has the most innovative and secure cloud computing system in the world, it is in a very advantageous position to offer contents over mobile devices. Amazon has started moving from directly selling merchandise on their own behalf to providing a platform for connecting businesses and consumers. Barnes & Noble's tablet PC, Nook, is also famous for having more attractive functions than Kindle Fire. Nook users can access to several OTT services like Netflix, Hulu, and Pandora as well as huge archives of e-books. In addition, Facebook has 800 million subscribers worldwide. Facebook opens its API and gives the program developers the opportunities to create new original services within the Facebook platform. Facebook is developing its own payment system without accessing app store. Moreover, it is expanding the scope of contents library by forming an affiliation with European streaming service provider "Spotify".

The next type is the developers whose service is basically transaction of contents but they have their own web site. Broadcasters and OTT service providers come under this category. For example, the domestic N screen-service (TVing & Pooq) is charged for a fee. But service providers delete the buy button in the app

bypassing IAP policy and induce users to pay in their web site. Subscribers have to pay in web site to use broadcasting programs in the app.

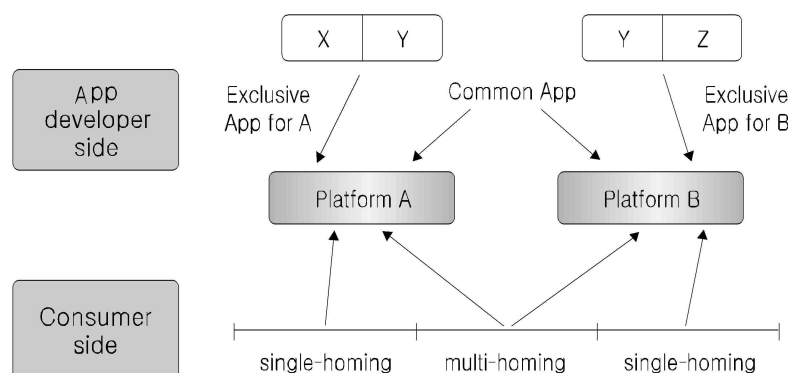
However, contents providers offering mobile apps such as KAKAO accept the rule despite they can bypass the IAP policy. Since their services are basically made for mobile device, it is more natural and convenient for users to pay in the mobile devices, so they accept the rule.

The last type is small-scale app providers who offer their apps for free. They can't afford to pay 30% transaction fee and there is no choice but to accept the rule. Otherwise it is inevitable for them to change their business model.

4.3 Investigation of anti-competitiveness of in-app purchase policy

There are currently five major app store providers: Apple App Store, Google Play, SK Planet T-Store, KT Olleh market, and Oz store which Korean developers can access. In the application store, developers and consumers constitute the two sides that trade with each other. Consumers download the applications through the app store. As more applications are available in the app store, the more valuable the app store becomes.

Figure 1. Two-sided markets with multihoming.



Source: Choi (2010)

Figure 1 is suggested by Choi (2010) to describe two-sided markets with multihoming. This can be applied to the application market of two-sided markets with multihoming.

To make judgement if in-app purchase policy at issue is anti-competitive, Apple's market share should be clarified in the first place though market share as a measure of dominance or significant market power is less relevant in multi-sided markets. The market share of Apple App Store is lower than Google as 30%, which does not meet the first criteria.

Next, it is necessary to find out if the rule excludes the rivals or abuses its superior position in the market against the developers. In mobile application market, there are several firms that compete in the presence of multihoming and their services are not compatible. Developers of applications are multihoming to other application markets. It takes a considerable time and professional efforts to develop the apps which can be suitable for other OSes. But they do because the marginal profit they can add is bigger than the marginal cost they have to pay. In addition, given the large number of mobile devices, they can access both Apple iOS and Android OS; there are many consumers who are multihoming as seen in Figure 1. If multihoming is allowed on the consumer side, consumers pay attention to the nature of content available as well as the amount of content.

What is more, content providers (such as Amazon) and device manufacturers (such as Samsung) enter the app market aggressively and create their own app stores. A company that distorts the market has to have abilities to destroy the profit margins of competitors and block them from the entering the market. In this context, Apple has no ability to hinder the new entrance and exclude the rivals.

Therefore, it is not desirable for regulators to intervene at the moment to ensure the development of the market and consumers' right of choice if there are sufficient opportunities for other companies to enter the market and for consumers to choose from other app markets.

5. Discussion

An ICT platform has dynamic and complex nature in itself. New firms enter the mobile platform market continuously with new technologies and new service models. Application markets as a typical meta platform are leading new mobile ecosystem which provide the playing field for diverse components to get together. Apple's in-app purchase policy is not favorable for developers. Apple takes 30% of sales price for a transaction fee while Google Play apportions 30% of sales price to payment processor and telecommunications companies to further expand Android OS in the global market.

Though the amount of transaction fee written in Apple's in-app purchase policy is not low, both developers and consumers are not locked-in. Developers are trying to find out new alternatives without accessing app store. Some developers move to mobile web apps (html 5) while others join hands with hardware manufacturers to sell their contents without accessing app store. Effective competition in the app market is working with multihoming.

Consumers also multihome to Android OS using multiple mobile devices. Some users select tablet PC loaded with Android OS. As the market share of Android market is much bigger than Apple's, there are more apps in Android market for consumers to access. The ability of consumers to multihome generally makes it more likely that firms will block compatibility. Since developers can multihome to other app stores, app store operators have a little incentive for product differentiation. The fact that developers and consumers multihome makes platform operators reflect what they want from the market.

In conclusion, it is not proper to regulate the in-app purchase policy though some regulatory concerns are valid. However, mobile platform operators should lower the entry barrier to developers and make ecosystem more productive. They have to protect both developers' right and consumers' right to induce them to the store. To make ecosystem grow and sustain vigorously, developers should innovate technology and invest continuously. Mobile platform with multi-sided markets should seek the way to enhance users' welfare as well as dynamic efficiency of market by innovation of technology and product differentiation.

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