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# How Platform-To-Business Relationships in Mobile Telephony Ecosystems Should Be Addressed in A Competition Law Perspective?

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# Cooperation, Dependence and Eviction
# How Platform-To-Business Relationships in Mobile Telephony Ecosystems Should Be Addressed in A Competition Law Perspective?

*Frédéric Marty* [*], *Julien Pillot* [†]

## Résumé

Cette contribution porte sur les effets des décisions concurrentielles dans le domaine des systèmes d'exploitation mobiles en regard de leur structure de plateforme biface. S'appuyant sur la notion d'investissement complémentaire, elle se propose d'analyser les relations entre la firme pivot de chaque système et ses partenaires. Il s'agit d'évaluer en termes concurrentiels les dispositifs techniques et financiers qui les lient. Au-delà de cette question liée à l'évaluation de leur effet net sur la concurrence, il s'agit également de s'interroger sur les possibles abus d'exploitation et d'éviction qui peuvent résulter de telles relations complémentaires mais asymétriques. Cette contribution discute enfin les possibles effets de remèdes concurrentiels portant sur ces relations.

**Mots clés :** Systèmes d'exploitation mobiles, Marchés biface, Abus de position dominante, Concentration, Remèdes

**Codes JEL :** K21, L13, L86

## Abstract

This contribution aims at analysing the potential effects of competition law based decisions in the mobile operating systems domain, considering their two-sided structure. Based on the notion of complementary investments, it proposes to investigate the relationships between the pivotal player and its partners. After establishing the economic and technical grounds underlying their contractual relationships, we assess them under the length of competition laws requirements. We show that, despite the gains that can result from these relationships, their asymmetrical nature may induce abuses of dominance or anticompetitive takeovers. However, we stress that competition law based remedies may be poorly efficient to address these issues.

**Keywords:** Mobile Operating Systems, Two-Sided Markets, Dominant Position Abuses, Merger Control, Remedies

**JEL Codes:** K21, L13, L86

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# Introduction

The current debate on the power of dominant firms in the digital industry is mainly based on the concentration of economic power they achieve and its possible irreversibility. The first dimension of the problem lies in their ability to acquire a position of ultra-dominance. The second question concerns the effective contestability of these positions, for which control over users' data would constitute impassable barriers to entry. Finally, the third question is about the impact of the firms' strategies on the acquisition, upkeep and expansion of such dominant positions.

There are growing concerns about the capacity of competition agencies to prevent these competitive risks through their M&A control policies, or to effectively sanction firms' strategies aimed at foreclosing existing or even potential competitors from the market. In a way, dominant firms in the IT sector are suspected to control financial and technical resources, as well as *nowcasting* capabilities, likely to prevent them from any potential competitive threat. Then, any company whose products or services would be likely to contest, even on the long run, the dominant firm market shares would enter a *kill zone*. A counter-intuitive result should then be highlighted: ecosystem *insider* players would be particularly exposed to this risk.

Such a situation may seem paradoxical. Indeed, whether the platform (here the mobile OS) is open or closed, it is basically a two-sided market. On the one side, it needs a critical mass of users and, on the other side, it seeks for major industrial partners and developers. Both are required in order to fully exploit cross-network externalities. The literature shows how system integrators stand to gain from creating a cooperative ecosystem (Gawer and Cumano, 2002). Such cooperation involves contractual mechanisms to distribute financial incentives to ecosystem members, the pooling of (technical) resources and implicit non-competition commitments. For example, Gawer and Henderson (2007) show that Intel avoided developing products that were potentially competitive with those offered by its *complementors*[1], unless the performance of the latter was unsatisfactory or if it appeared necessary to strengthen incentives for innovation through a competitive threat. As Zhu and Liu (2018, p. 2620) note: "By

[1] We use here the term complementors, as used in management sciences. These are independent companies developing complementary products that are interoperable with the technical system developed by the pivotal company, which has chosen to develop an architecture that is technologically open.

committing to not competing with them Intel could encourage these complementors to make [substantial sector specific] investments".

In this light, how to appreciate entry decisions on a market segment previously occupied by a complementor? Is it for substituting internally developed services to replace complementors' ones as soon as they are seen as not efficient enough? Or, is it the first stage of a two-step non-cooperative strategy? In such a strategy, the initial cooperative phase aims at detecting promising (or potentially disruptive) third parties' developments and then, to replace them by its own products and services (or take control of the *complementor*) in a second phase. These strategies implemented by ecosystem leaders is likely to maintain and expand their dominant positions within their ecosystems. They can also be combined with those that could be implemented without ecosystems.

Our purpose is to consider these specific form of *coopetition* strategies. How to assess the competitive effects generated by such relationships? The case of mobile operating systems illustrates how agreements that financially and technically organize such complementarities may have pro- and anticompetitive effects.

Financial incentives or free provision of resources to complementors, two practices at the heart of the European Commission's Android decision[2], may be justified on efficiency grounds. As such, these practices could be defended on the basis of two-sided platform's constraints. Basically, competition law does not sanction B2B cooperation when it results in promoting economic efficiency or innovation[3].

Hence, in the Android decision, the pre-installation of applications and the remuneration paid to complementors could have been found procompetitive rather than be considered as part of a foreclosure strategy. The same goes for anti-fragmentation agreements. These could have been justified by safety objectives (both for the app' developer and the OS owner) as well as interoperability objectives. To that extent, contractual terms made to third parties (app

[2] European Commission, 18 July 2018, press release IP/18/4581, Google Android case, No. 40099.
[3] The horizontal cooperation agreements that can be accepted by the Commission cover a very broad area of B2B cooperation. Seven main types of agreements are concerned: research and development, production, purchasing, marketing, standardization, environmental or even information exchange agreements.

developers, terminal manufacturers, and mobile network operators) could be analyzed as part of a logic of complementary developments within an ecosystem.

The latter is both a two-sided structure in the sense of its business model - having to link several sides to unlock value (thus possibly justifying pre-installations and financial incentives) - and in the sense of its technical architecture (requiring rules to guarantee compatibility of developments, such as anti-fragmentation agreements). In a nutshell, each of the three practices that led the European Commission to impose a fine of more than four billion euros on Google (profit-sharing, pre-installation of applications and anti-fragmentation agreements) could have been defended on the basis of efficiency, with regards to two-sided platforms' economic and technical specificities.

At the opposite, while these ecosystems might be collectively desirable in terms of efficiency, they may however give rise to abusive strategies, especially exploitative or exclusionary abuse. Most third party developers are yet in a situation of economic dependence vis-à-vis the platform's owner. Thus, taking into account these (inter)dependence relationships may be essential to assess the likelihood of a foreclosure attempt (under Article 102 TFEU), as well as the competitive damages that may result from notified concentrations.

At last, attention should be paid to the effects of remedies imposed to bring a potential infringement to an end, both in the context of merger control and competition issues. Remedies could accidentally harm consumers and competition if it results in the loss of some of the gains flowing from actors' coordination. Similarly, remedies may have insufficient effects, especially if it occurs too late, when the integrated firm has fewer incentives to share investments (and value) with complementors.

Our purpose is structured as follows. First, we introduce how cooperative ecosystems are set up in two-sided platforms, and how complementors benefits from the sharing of technical resources and from financial incentives. Second, we show that this technological and competitive symbiosis results in economic dependence. Third, we focus on the risks complementors have to assume. We illustrate these risks both by anticompetitive practices flowing from asymmetries in data access, and by buy-out strategies aimed at neutralizing potential competitors. At last, at the light of the EU Commission decision in *Android*, we

discuss these complementary relationships under the prism of the damage theory, and question the effects of competitive remedies.

## Section 1: Cooperative ecosystems and two-sided models: how to analyze P2B relationships in the case of mobile operating systems?

Whether a mobile operating system (hereinafter MOS) is opened like Google Android or closed like Apple iOS, it implies various stakeholders, including app developers, and relies on cooperative strategies, including from the core (or integrating) company itself. Such an organization allows actors to share investments and competences to co-construct a value network. The integrator firm pools *boundary resources* for the benefit of all, including its complementors'.

The MOS is designed as a two-sided structure both in terms of business model and technical architecture. Such platforms rely on externalities between developers and users. It is then rational for the platform owner to *subsidize* developers to reduce their technical and financial barriers to entry, and to encourage them to adopt the MOS. Each new developer contributes to the enhancement of the ecosystem as a whole, and benefits from it in return.

### A - The provision of *boundary resources*

According to Vezzoso (2018a), digital platforms are much more than mere demand aggregators, but have to be seen as *catalysts* for a system of complementary innovations. An Android-like platform is based on technical and institutional mechanisms that aim to promote and guarantee indirect network externalities between the different users of the platform. In a way, a third party developer is also a *customer* of the platform: both access the market and also the effective development of the offering depends on the services provided by the platform owner. In other words, a platform is not reducible to a *matching algorithm* but is also a modular production network relying on complementary resources and investments[4].

As such, platform's ability to attract key complementors is a crucial success factor. The MOS owner has to generate enough trust in its capacity to create collective value to encourage third-

[4] For an application to the world of microcomputing with the IBM standard, see Moore (2006).

party investments in specific assets. In the case of Android, which came on the market later than Apple's iOS, it was positively a *sine qua non* condition for catch-up[5].

Such modularity obviously generates efficiency gains. It reduces barriers to entry and ensures devices and services interoperability. Meanwhile, it reduces costs and interface problems. As noted by Wen and Zhu (2017): "By providing efficient matching or development kits, such platforms have also significantly lowered the barriers for many small firms or individuals to innovate and to market their products and services".

The openness of the platform has to be analysed both in terms of resources availability (intellectual property rights, data, *open source* licenses, etc.) and of access policy (Vezzoso, 2018a). *Start-ups* entering the ecosystem obtain resources to interact with all other actors (APIs and SDKs - *software development kits*). This allows the platform owner to attract innovative companies and to ensure interoperability, while preserving its control over the ecosystem. The platform therefore provides its ecosystem members with resources that ensure interoperability of services, compatibility of developments and economies of scale and scope (Eaton et al., 2015). This provision is essential to make possible the construction of a complex ecosystem by heterogeneous and uncoordinated actors. According to von Hippel and Katz (2002, p. 824), these *boundary resources* transfer design capabilities to users.

These resources include every contractual or technical asset likely to interface third parties' products and services with those of the platform (Ghazawneh and Henfridsson, 2013). These resources, which are made available free of charge to new entrants, drastically reduce barriers to entry, coordination and transaction costs: "[Their] use [...] is aimed at lowering the often large development and commercialization costs to new operations, therefore helping to create wider network effects [...]" (Lauslahti et al., 2017, p7). In other words, they secure and facilitate third-party investments, which generate complementary assets in return (Teece, 1986). It allows each app to automatically adjust to changes resulting from decentralized and uncoordinated decisions by all ecosystem members (Ghazawneh and Henfridsson, 2012).

However, this model of complementary investments does not involve firms occupying at least balanced, if not equivalent, positions in the ecosystem. The integrating firm, which acts as a

[5] It should be noted that Apple had made the same choice (but within a closed ecosystem) and had even anticipated it by making Safari available to website publishers.

gatekeeper and coordinator for third party investments, is in a pivotal position (Mansell, 2015). It is both a *business provider* and an orchestrator of technical developments (Lynskey, 2017).

## B - An attractive business model for all its stakeholders

Beyond the abovementioned technical dimensions, integration into an ecosystem can also be financially attractive for complementors. The MOS is not only a business provider, but its owner has incentives to *subsidize* key complementors to be part of the ecosystem.

For instance, in *Android*, the Commission fined Google for having "made payments to certain large manufacturers and mobile network operators on condition that they exclusively pre-installed the Google Search app on their devices"[6]. In this logic, the MOS owner redistributes to third party some of the network externalities generated jointly. As abovementioned, incentives can also be provided by making *boundary resources* available free of charge. This profit sharing is mutually beneficial since it strengthens network effects. According to Lauslahti et al (2017, p.7): "Digital platform owners mostly benefit from sharing boundary resources with third parties by capitalising on split revenue business models".

Surplus redistribution among the ecosystem members can also give rise to price protection mechanisms. The case of Apple v. Pepper, on which the US Supreme Court had to rule in November 2018, illustrates this point. The question was whether or not transactions between app developers and end users are carried out under Apple's effective control[7]. This case helps to shed light on the nature of the links between developers and ecosystem managers. An *amicus curiae* submitted to the Supreme Court shows the ambiguity of the relationship between the different stakeholders, which covers both an economic dependency relationship and a mechanism for redistributing the rent within the ecosystem.

If an app developer is likely to accept unbalanced competition practices, is it because it fears some retaliation measures from the integrated firm, or because it also benefits from redistribution mechanisms? « In this case, app developers are not likely to seek damages for potential antitrust injuries from the exercise of Apple's monopsony power. Developers who bring suit against Apple risk jeopardizing their access to the App Store, as Apple can seek

[6] European Commission, 18 July 2018, press release IP/18/4581, Google Android case, *op.cit.*
[7] See in particular Chaiehloudj (2018) for a presentation of the case.

retribution against them in any of a myriad of different ways. In addition, many app developers may be unwilling to sue Apple for its monopolization of the app distribution market due to a perception that Apple may manipulate the pricing and sale of the apps in ways that ultimately benefit the developers" (Vaheesan, 2018, p.3).

Indeed, Vaheesan (2018, p.13) highlights that the rule imposed by Apple on the App Store, to impose prices ending in 99 cents has the effect of increasing developers' revenues by limiting price competition. For the monopsony (who Apple's App Store *de facto* is), it is also a way to redistribute part of its income to developers. The same intuition is highlighted by Posner (2018, p.18) who draws a parallel with the Microsoft case: "in exchange of agreeing to exclusionary provisions in their contracts with Microsoft, the manufacturers received various benefits, including discounts, cooperation in development, and greatly enhanced computer sales via the continuous upgrading".

## Section 2: A symbiosis covering a situation of economic dependence?

However, to access the ecosystem, complementors must accept the risk of *swimming between sharks* (Diestre and Rajagopalan, 2012). Complementors' dependence comes both from the absence of interoperability between competing ecosystems (sometimes voluntarily reduced), and the strong market concentration since platform are naturally *winner takes all* markets (Zhu and Iansiti, 2012). In a nutshell, platforms are coopetition markets in which firms share their resources to create value, but compete to maximize their profits (Brandenburger and Nalebluff, 1997). With respect to the incomplete contract theory, complementors - who make specific investments - are particularly exposed to a risk of *hold-up* (Williamson, 1975).

The MOS is then a *contracting nexus* involving numerous and heterogeneous stakeholders[8] in a value creation process. But, even if the coopetition model prevails, the contractual power is asymmetrically distributed among actors since only the integrator benefits from the *regulatory*

[8] The *Wintel* case (Microsoft Windows for the OS and Intel for processors) is often presented in the literature as iconic of cooperative strategies between complementors in the PC ecosystem. However, the idea that the two undertakings create value together and then compete only to share it out has been challenged in the literature (Casadeus-Masanell and Yoffie, 2007). First, if not coordinated, their respective pricing decisions can generate negative externalities on the pair. Second, the different life cycles of their products can lead to divergent and asynchronous investment strategies.

*power* (Boudreau et al., 2009). Completors rely on the pivotal firm both to develop their services and to access the market[9].

The risks complementors have to assume are all the more important as the pivotal firm can collect data on their activity to compete with them ultimately. For instance, in September 2018, the EU Commission has announced the opening of an investigation into how Amazon use data related to the activity of independent merchants on its marketplace to adjust its own offers (Auer, 2018). Indeed, as the pivotal firm owns a *gatekeeper* position it could take advantage of it to reduce the visibility of the complementary offers through, for example, the manipulation of its *ranking*[10]. The pivotal firm can also buy promising startups before it becomes a potential threat, like Facebook's takeover of Instagram (Li and Agarwal, 2017).

Then, such platforms place complementors in a double situation of technical and economic dependence vis-à-vis the integrator[11]. Technically, the platform owner can exclude third party offers from the application store. Economically, exclusionary strategies can be achieved through less favorable access conditions or, even more sharply, by bundling a substitute offer at no additional cost as a standard feature of the platform. Microsoft bundling practices can be read under that prism[12].

In *Platform to Business* cases, the Commission concerns about unfair contractual clauses or practices, the opacity of trading conditions and the lack of clear criteria for resolving disputes involving third-parties and the platform owner. The Commission therefore aims to define "principles of preventing abuse of market power and ensuring that platforms that serve as a gateway to downstream market do not become gatekeepers" (European Commission, 2018). Platform owners has the unilateral power to deny (or to significantly impede) access the market to third-party developers. This can be achieved, for instance, through dereferencing, modification of contractual conditions, discriminating between offers…). Such unilateral power resulted in the ability to impose unbalanced contractual conditions (Marty, 2018).

[9] See the report of the National Digital Council (2014) on platform neutrality.
[10] Such as Zynga's position after the reduction in the number of games appearing on Facebook's newsfeed.
[11] The Commission notes that economic dependence mainly occurs when the "asymmetry between the relative market strength of a small number of leading platform – not necessarily dominant in the sense of competition law – is combined with a highly fragmented supply-side of many small business users". (2017, p.25)
[12] European Commission, Decision of 24 March 2004, Case COMP/C-3:37.792. Microsoft.

In this regard, Vaheesan shows that Apple benefits from regulatory-type powers over its complementors (2018, p. 6). It "includes being made subject to the particular, and arbitrary, political and moral rules that Apple uses to regulate the nature of the apps that are available for sale to iPhone customers. And it includes being made subject to arbitrary, discriminatory manipulation in the act of shopping for and buying apps".

If Apple imposes unbalanced contractual terms to third-parties, its retaliation capacities could also protect it from potential lawsuits: "Developers who sue Apple for antitrust violations run the risk of being removed from the App Store and losing their access to end users-a threat that is not entirely theoretical" (Vaheesan, 2018, p.12). The same argument can be found in the *Amicus Curiae* produced in the same case by Eric Posner (2018, p. 16), which takes up on this point a reasoning already held by Hovenkamp (2003): "Many direct purchasers are "highly unlikely to sue" because they think they would be better off permitting an antitrust violation to continue rather than risking their relationship with the alleged violator".

In most of traditional coopetition models, companies cooperate upstream to create value and then compete downstream. In platforms models, downstream competition is distorted as long as the platform owner also controls the market access conditions. The platform is by itself an access lock and almost the only link between the ecosystem members and end users.

## Section 3: From symbiosis to *kill zone*: why pivotal firms can be led to exclude their complementors?

Pivotal firm and complementors are then engaged in a complex process of value co-creation, but the former benefits from a strategic position it may takes advantage of. In this third section, we explore market conditions in which platform owners have some strong incentives to exclude their complementors.

### A - Dissymmetry in data control that can lead to exclusionary strategies

The "cooperative" resource pooling mechanisms described above enable pivotal firms to detect, at a very early stage, promising new products or services, as well as potential disruptive innovation that could ultimately undermine their dominant positions.

In this context, takeover bids can be seen as the first means to prevent competitive threats in the long term[13]. Exclusionary strategies are the second. Microsoft, for example, is alleged to have excluded Netscape and Real Network respectively from the internet browser and music player markets, though that kind of practices (Vezzoso, 2018a).

Such exclusionary practices can be seen as *leveraging strategies*. These are also referred to as *platform envelopment strategies* in the management science literature. Shared resources and users' relationships allow the platform owner to entry into the complementor's market (Eisenmann et al., 2011). Most of the time, the complementor has no chance in remaining competitive when a substitute offer is directly provided by the platform (Zhu and Liu, 2018).

Control over data – but also broader client and technology knowledge – gives the platform owner the ability to implement *nowcasting* strategies (Stucke and Grunes, 2018): "Nowcasting also represents a potent data-based weapon, not previously available for monopolies, to monitor new business models in real time. The nowcasting radar can help some dominant firms identify nascent competitive threats".

The gradual replacement of offers developed by third parties by homemade services is an attempt for the platform owner to capture the existing or future value (Farrell and Katz, 2000). As described above, Microsoft's bundling strategy gave it the opportunity to extend its dominant position from the tying market (Windows) to two tied markets (the ones of Netscape and Real Player)[14]. *Predatory innovations* pursue the same goal (Schrepel, 2018).

Such strategies lie on "the modification of a technological platform and the technical design of a product-which are aimed at removing the compatibility of third party technologies with those of a dominant firm, or at impairing competing technologies operation" (Schrepel, 2018, p.22). In one case, exclusion is achieved through the voluntary degradation of interoperability. In the other, it is through the launch of a homemade product. Such a move would impair the competitiveness of existing complementary goods, and deter potential rival to enter the market.

[13] "The first reason is to protect its core business. A company operating in the market of software may use its experience as a springboard to ultimately compete with a dominant firm in the market of platform" (Schrepel, 2018, p.49).

[14] "In the Microsoft example, by eradicating a feature that allows removing the internet browser from the operating system, and by programming the system so as to bug when certain browser-related files are deleted, the company certainly engaged in predatory innovation" (Schrepel, 2018, p. 45).

The platform owner can also exclude a complementor by degrading the performance of its offer, for instance in delaying the transmission of information needed for updates (Schrepel, 2018, p.28), or via a *demoting*-based strategy (as reproached to Google in the Google Shopping case). The EU Commission suspects Amazon to engage such practices towards the independent resellers of its marketplace. Amazon could exploit aggregated commercial data, as well as unique sourcing capabilities, to detect and then self-distribute the bestsellers. Such an information asymmetry is incompatible with the principle of fair competition (Auer, 2018).

As stated by the Commissioner: "The question here is about the data, because if you as Amazon get the data from the smaller merchants that you host […] do you then also use this data to do your own calculations? What is the new big thing, what is it that people want, what kind of offers do they like to receive, what makes them buy things. These concerns relate to the fact that Amazon acts as both a retailer in its own right and a platform for other retailers, which allegedly constitutes a "conflict of interest"[15]. This risk is also highlighted by Zhu and Liu (2018, p.2620). The latter, based on an empirical study on Amazon's marketplace, show that "Amazon's entry strategy is likely premissed on acquiring new information after forming partnerships with third-party sellers".

### B – Exclusion through anti-fragmentation agreements

Exclusionary practices can also rely on anti-fragmentation agreements, as described above (Marty and Pillot, 2018). Admittedly, such agreements can be defended on the basis of interoperability and security. But, as counterparts for the boundaries resources shared by the platform owner with no additional costs, these agreements[16] are also a powerful tool to prevent any *disruption risk*.

For example, within the Android ecosystem, terminal manufacturers had to accept the Mobile Applications Distribution Agreement (MADA) to get an Android license. Basically, MADA does not allow manufacturers to select apps on a discretionary basis, and even force the pre-installation of several Google apps such as *Search* or *Maps* (Marty and Pillot, 2018). From an economic perspective, such a requirement makes sense as the platform is two-sided and the end

[15] M. Verstager, press conference of 09-18-2018. For a perspective and discussion of this case see Auer (2018).
[16] Such as CDD (Compatibility Definition Document) and CTS (Compliance Test Suite).

users operate Google's services for free. Then, Google needs a critical mass of users to get a return on investment.

With MADA comes AFA, for Anti Fragmentation Agreements which aims at impeding development of alternative versions of the MOS, called *Android forks.* While third parties are in principle allowed modifying Android's source code (openly accessible) to create *forks*, in practice devices manufacturers had to commit not to sell even a single smartphone running on an Android *fork* if they want to pre-install Google's proprietary apps on their devices. When MADA can be justified by the economics of two-sided models, the rationale of AFA lies on the prevention of incompatibility issues. But, such a practice also reduces incentives to develop potential competitive offer to Android[17]. Thus, the control over *boundary resources* gives the platform owner a strong (and defendable) competitive advantage (Vezzoso, 2018a).

### C - Buyouts strategies to exclude potential competitors

Not only are the major players in the digital economy continually fueling their growth through the acquisition of promising *start-ups* at a frenetic pace[18], but these buyouts often involve companies that are part of their ecosystem. This is a usual practice in the biotechnology industry where innovation is mainly pushed by small and medium-sized firms. Indeed, in that industry, major companies - that are reluctant to assume the R&D costs and uncertainties - prefer to buy companies (and patents) once these risks have been removed (Mangematin, 2003). However, things are different in the digital world where such acquisitions seem much more motivated by the need to prevent a potential competitive threat, rather than the necessity to support and fund the growth of promising start-ups (Posner and Weyl, 2018).

Indeed, in the IT industry, even the GAFA's dominance can be disputed by a challenger offering a *disruptive* product or service (Christensen et al., 2015), such was Nokia in the telephony market (Vuori and Huy, 2016). Some buyouts can then be seen as a weapon to prevent any

[17] Two different fragmentation risks could be distinguished. *Soft fragmentation* occurs when an OEM voluntary delays the update of the MOS. This may result in security and compatibility issues likely to degrade the general user experience. *Hard fragmentation* happens when one third-party modify the MOS by and for its own. Such models "in silo" take away the economic advantage flowing from standardization. For example, according to Vezzoso (2018b), Linux was one of the first OS to be forked. As for Android, forks are Amazon's Fire OS and the Aliyun OS project developed jointly by Acer and Alibaba.

[18] According to *The Economist*, GAFAM invested more than $31.6 billion in external growth operations in 2017. Since 2013, Alphabet has reportedly invested $12.6 billion to take control of 308 startups.

*disruption* risks. Facebook's takeover of Instagram and the acquisition of Picasa by Google, as an attempt to respectively remain dominant in the social network market and to promote Google Photos, are two perfect examples.

In a way, once a promising start-up has reached a certain stage of development, it would entry a *kill zone*. The concept comes from Microsoft's practices towards its complementors in the 1990s which, to some extent, could be seen as an "embrace, extend and extinguish" strategy[19]. Basically, every promising start-up already acting as a complementor in an ecosystem controlled by a major Tech company is particularly exposed to a buyout risk: "they will eat their own children to live another day"[20].

Third-parties can barely deal with such buyouts attempts, particularly because traditional response strategies, such as price competition, low-cost approaches or better user experience, are almost inefficient in the present case (Edelman and Geradin, 2018), if not impossible (Geradin, 2018). Indeed, two-sided platforms have a *zero price* business model and competition on the tied markets is based on quality. As the platform owner is vertically integrated and benefits from the *gatekeeper advantage*, it represents a very credible threat of market exclusion for complementors (Bostoen, 2018). With that in mind, the latter are all the more likely to accept a friendly takeover approach.

Besides, several structural factors increase the likelihood of *Kill zones* as compared with 1990's. First, numerous *start-ups* have the overall objective of being taken over by a leading company. Second, Tech Giants benefits from huge capacities in data capture and exploitation that gives them the ability to detect potential competitive threats much earlier than in the past. Third, dominant firms own an unprecedented stock of scarce resources, including engineers. As most of the start-ups just cannot offer comparable salary conditions, they often appear less attractive than Tech Giants.

Finally, takeovers of complementors are also the result of competition among platforms. In the Apple-Shazam M&A case[21], the Commission questioned how access to Shazam's data could distort competition both on the music streaming market and the one for devices. As a vertically integrated group, Apple could be encouraged to downgrade Shazam's music recognition algorithm for competitors' customers.

[19] Smith N. (2018), "Big Tech Sets Up a "Kill Zone" for Industry Upstarts", *Bloomberg Opinion*, 7th November.
[20] "American tech giants are making life tough for start-ups", The Economist, 2nd June 2018
[21] Case M.8788, decision of 6 September 2018.

Apple's acquisition of Shazam has been notified on March 14, 2018. On 23 April, the Commission decided to conduct a thorough analysis of potential competition risks, both on the market for music recognition and the one for devices (and tied MOS). On the one hand, horizontal concerns in the market for music recognition were quickly outcast, as alternative services remained on the market. On the other hand, even if vertical concerns have not given rise to remedies in that case, it is worth to assess how Apple could take advantage from the acquisition of strategic information about its competitors' customers. Indeed, most of the Commission concerns were about the way Apple could access sensitive data on Android users' preferences that could be used for marketing and competition purposes.

Even if the Commission finally found that the takeover was not likely to harm competition (Zingales, 2018), how the case has been investigated is of particular interest. In practice, as Shazam has integrated its API with Spotify's, Apple could match-up the data coming from these two services with the data provided by Apple Music's users to target its marketing investments. Similarly, when Shazam is installed on an Android phone, it can access to the list of apps installed on the terminal which can be used strategically by Apple. Other competition concerns were about the possibility of reserving Shazam for the sole Apple customers or to degrade the service quality for Android users.

The Apple-Shazam case shows how one takeover might hinder competition when it results in granting the dominant firm a decisive informational advantage. One could wonder if requirements usually held in merger control procedures are well designed to assess how the concentration of massive (and initially fragmented) users' data is likely to distort competition in the long term.

## Section 4: What role for competition rules?

Strategic relationships between platform owners and complementors are complex. As, coopetition can meanwhile generate procompetitive and anticompetitive effects, such cases have to be undertaken with the greatest care by competition agencies, whether it be for assessing the damage to innovation and competition or for designing efficient remedies.

### A – How to assess the potential damage to innovation and competition?

## 1. Fair expansion strategies or exclusionary abuses?

Most of complementors are fully aware about the risks associated to two-sided models when the platform owner is (or could be) integrated both vertically and horizontally. They could then adjust their *ex ante* behavior and strategy in order to avoid the *kill zone*, e.g. deter the platform owner from extending to its market[22]. If the threat of integration is high, R&D investments shift to other markets and functionalities as the risk of contractual hold-up increase. Moreover, the effective entry of the platform owner is often beneficial to consumers on the short term as it reduces transaction costs and underinvestment bias (Wen and Zhu, 2017).

However, uncertainties about the future conduct of the platform owner are likely to dissuade third parties from entering into long-term relationships and making specific investments. Such a situation may reduce further incentives to innovate (Geradin, 2018)[23]. As two-sided platforms are mostly operated at zero price on the end user side, exclusionary of complementors through vertical integration may not reduce the consumer welfare since the platform owner provides more efficient or less expensive substitutes. However, such a practice harms innovation as it restricts freedom of choice as well as it prevents the emergence of alternative technological trajectories.

With such unbalanced relationships, what are the options open to complementors? Niche strategies are a first option. Non-cooperative strategies that consists in restricting data sharing with the platform owner are a second one (Zhu and Liu, 2018, p.2637). However, the sustainability of the latter option is somewhat hard to believe since the platform owner often has control over end users' data. In any case, the platform owner is in a position to exclude from the market a complementor that could eventually prove to be a potential competitor. Such a practice could challenge the *contestability* of the market and give rise to irreversible dominant positions. Then, despite obvious information asymmetries and incompleteness, competition agencies have to balance pro and anticompetitive effects and determine how exclusionary practices could harm competition, innovation and consumers in the long term.

## 2. In M&A cases

[22] Such a result has been established for independent vendors on the Amazon platform (Zhu and Liu, 2018).
[23] Such as in Microsoft (2004), in which the Commission stated that "restrictions should not create disincentives to compete with Microsoft, or unnecessarily restrain the ability of the beneficiaries to innovate".

In M&A cases, several questions may be asked. First, what are the revenue and the market share of the target? Most of the IT start-ups are not desirable because of their performance indicators, but for their technologies, their patents and sometimes their brands and services by themselves. In that respect, usual structural indicators (such as HHI) say few about potential competitive risks[24]. Those are all the higher as platform owners are structurally focused on the future markets and compete in search for new and low end market footholds. They engage corporate ventures in frontier technological areas, and attacks peripheral markets (Petit, 2017). As platform owners follow mimetic conglomerate expansions schemes, customer lock-in into *silos* and market foreclosure are two serious risks in the long term that antitrust agencies have to take into account.

At this point, one may argue that a specific regime should be implemented for every conglomerate expansion project that involves a dominant firm and one complementor. But, vertical integration is not problematic in itself. As abovementioned, it a usual in the biotech industry to let small and medium-sized firms endorse most of the R&D expenditures, and to vertically integrate them once innovation risks have been mainly removed. Thus, adopting a specific regime could distort established investment schemes in some industries.

Similarly, in IT sectors where there are strong needs for convergence and integration of services, reinforcing merger control proceedings may finally prove harmful to end users. However, as we have seen above, excessive market concentration can result in technological monopoly and huge switching costs for end users likely to foreclose markets in the short term, and restrict the development of alternative technological trajectories in the long term. How to balance pros and cons effects in a context of incomplete and asymmetric information yet?

[24] Traditional indicators should be supplemented by, for example, the stock market capitalization of the target (as proxy of the future consolidated cash flow) future or the mass and quality of data the consolidated group will control. This is the meaning of the German reform on merger control that came into effect on 31 March 2017. In addition to the traditional market share criteria, *the value of the consideration paid in return for the transaction* is now taken into account. If the amount exceeds €400 million, the deal is subject to preliminary check, with no regards to the parties' revenue or market shares (Schweitzer et al., 2018 and Budzinski and Stöhr, 2018). More generally, on *innovation markets* see, for instance, Gilbert and Sunshine (1994) in which the authors question if patents or R&D expenditures should be adopted as indicators of the likelihood of the consolidated group would have the capacity to distort competition in the future.

To that extent, the French competition agency proposes to implement an *ex post* control procedure for mergers[25]. Such control already exists in some EU Member States, including the United Kingdom and Sweden, "where particular grounds exist", e.g. when the competition agency considers that the nature of merger call for an observation period to scrutinize its impact on the economy. Two questions can then be asked. First, how long should this observation period be? Second, how to deal with the legal uncertainty that such observation period introduces? On that particular point, the French competition agency proposes to publish clear guidelines and to limit the period in which such an *ex post* control could be implemented from 6 months to 2 years[26]. Even a shortened period may seem very long in digital industries.

## B - What are the effects of competitive remedies?

Coopetition relationships in two-sided markets are complex. The same applies to the assessment of economic pros and cons when mergers between the platform owner and one complementor, or unilateral vertical integration moves are involved. Such a context makes very difficult to design efficient remedies, e.g. remedies likely to preserve the contestability of the markets without harming end users.

For example, in *Android*, the EU Commission required Google to bring some anticompetitive practices to an end (pre-installation of Google's home services, including Search, Chrome and Play Store; financial incentives conditioned to exclusive installation of Google Search, and anti-fragmentation agreements). However, the EU Commission did not ignore the two-sided nature of the market as it states that "the decision does not prevent Google from putting in place a reasonable, fair and objective system to ensure the correct functioning of Android devices using Google proprietary apps and services, without however affecting device manufacturers' freedom to produce devices based on Android forks".

To comply with the Commission's injunctions, Google proposed a set of remedies, including:

- Disjoint distribution of Google Play's Search and Chrome applications;
- Disjoint and non-exclusive distribution of free licenses for Search and Chrome;

[25] On October 20, 2017 the French Competition Authority (FCA) has launched a public consultation to modernize and simplify French merger control regime. See the public document at: http://www.autoritedelaconcurrence.fr/doc/consultation_concentrations20oct17.pdf

[26] It should be noted that such a time limit does not exist in the United States.

- Full licensing for Google Play and 8 other services (including Gmail, Google Maps...), with price discrimination regarding the range of the device. The end of free access is intended to compensate the loss of the two-sided effect described above.
- Removal of anti-fragmentation clauses. Then, manufacturers will be able to develop devices running on Android fork, as long as they inform consumers about the potential lack of compatibility with apps developed for the official MOS.

Although these remedies do not challenge the MOS model *per se*, they partially undermine it yet. For instance, financial incentives towards manufacturers and phone operators could be seen as a way to redistribute part of the co-created value. Forcing Google to put an end to that practice may then have undesirable effects, such as increase in price in the device market, especially for entry-level products. Similarly, putting an end to anti-fragmentation clauses may incite Google replace Android by a new MOS. Such a move would impose huge switching costs both for undertakings and end users. It is no accident if Google is already working on a next generation MOS, expressly confirmed under the codename "Fushia". But with no need to catch-up a leading edge technology this time, as it was in 2007 when Apple disrupted the smartphone market, would Google maintain an open architecture for Fushia?

Consequently, not only such remedies may not prove efficient, but they also may arrive too late while several Asian OEMs (such as ZTE and Huawei) presently works on their proprietary MOS. Interestingly, it is not antitrust proceedings but international trade policy considerations (especially tensions between the United States and China) that encourage OEMs to entry the MOS market. But, from the economic perspective, the more OEMs, the more fragmented are investments, and the more important are development costs to avoid interoperability issues.

Moreover, regardless the EU Commission decision in *Android* and how US jurisdictions will settle in *Apple vs Pepper*, it is almost fuzzy to forecast how relationships between MOS owners and complementors – especially *native app* developers[27] – will evolve in the near future. With the progressive emergence of *Progressive Web Apps*, interdependence between platform owners and complementors could no longer be taken for granted. PWAs are less costly, as these are not specific to one given ecosystem, and entail less update costs than native apps. PWAs

[27] At early stage, the development of *native apps* required numerous third parties and entailed significant costs (particularly with regard to update constraints). But, these native apps have not always met expectations, offering sometimes low user experience and value added compared to a website with responsive design capabilities.

are also somewhat users friendly since they save storage space and offer offline functionalities. The more PWAs will be widespread, the less relevant will the *symbiosis model* be.

For all these reasons, the efficiency of remedies is nearly impossible to attest from an *ex ante* basis. The nature of the tradeoff will almost exclusively depend on how firms will adjust their business and technology strategies following the proclamation of remedies, and how they would have behaved in their absence in the long run. As competition agencies have few – if any – control on these issues, the risk of moral hazard looks incredibly – and perhaps unwisely – important.

## Conclusion

MOS are the keystones of very complex P2B relationships between the platform owner and complementors. Such coopetition relationships in two-sided markets have both technical and business justifications. P2B cooperation has the advantage to share innovation risks and investments among several firms, and to create shared value in return.

However, such a market organization confers a strong structural advantage on the platform owner as it benefits from a position of market gatekeeper, and controls most of the users' data. Basically, the platform owner could take advantage of its specific market position to engage some exclusionary practices, such as unfair *envelopment strategies*, likely to hurt innovation (Geradin, 2018)[28]. While such practices do not harm consumer welfare in the short term (as services are most likely to be proposed at no additional costs once integrated by the platform owner), it could restrict freedom of choice in the long term as it prevents the emergence of alternative technological trajectories.

There are ongoing discussions on the standard competition agencies should apply to cases that involve two-sided markets. For example, the *effective competition standard* proposed by Steinbaum and Stucke encompasses not only the consumer welfare dimension, but also seek to protect/preserve competitive marketplaces, undertakings with no market power and more

[28] "When a dominant platform degrades interoperability or compatibility of complementarity services, it hurts innovation"

generally atomistic competition, free access to the market, and future opportunities for innovative firms (Steinbaum and Stucke, 2018; p. 30-31).

However, it is not clear whether such a standard could be efficient in two-sided IT markets. Indeed, two questions remain. First, how can we characterize any market power if the relevant market itself cannot be unambiguously defined? As Budzinski and Stöhr (2018) note, market power is a distributed and relative phenomenon whose definition requires a case-by-case basis. Perhaps competition laws are less appropriate than contract laws to deal with that kind of cases.

Second, is it worth to extend the special responsibilities incumbent to dominant firms to every complementors and, more largely, every member of its proprietary ecosystem? We have shown that a platform owner exercises quasi-regulatory power over its ecosystem as it can unilaterally determine and change the prices and market access conditions. It can also influence their investment decisions. In a way, as long as rival ecosystems exist, most of the situation of economic dependence results from (more or less) efficient and objective strategic choices. But, when a single and natural standard emerges, complementors have no more *exit* options. At this point, competitive risks have unquestionably to be taken into consideration regardless of the complex nature of the market organization or the potential risks flowing from imperfect remedies.

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