



The gang of four: acquaintances, friends or foes? Towards an integrated perspective on platform competition

Ivanka Visnjic

Carmelo Cenammo

ESADE

Ramon Llull University

ESADE Working Papers Series

Available from ESADE Knowledge

Web: www.esadeknowledge.com

© ESADE

Avda. Pedralbes, 60-62

E-08034 Barcelona

Tel.: +34 93 280 61 62

ISSN 2014-8135

Depósito Legal: B-4761-1992

The gang of four: acquaintances, friends or foes? Towards an integrated perspective on platform competition

Ivanka Visnjic

Assistant Professor, ESADE Business School, Ramon Llull University, Barcelona, Spain
Business Models Research Lead, Cambridge Service Alliance, Cambridge University, UK

Carmelo Cenammo

Assistant Professor, Bocconi University, Milano Italy

May 2013

Abstract

The economics literature extensively focused on pricing and openness as key strategic choices of platforms in two-sided markets, with the ultimate goal to obtain network effects and win over direct competitors within the boundaries of a single market. We argue that, due to the business model innovations, such as platform envelopment, the platform competition today grows beyond the boundaries of a single market. To theoretically derive the competition implications of these business model innovations, we use the lens of the multi-market contact theory. Our study argues that platform competition unfolds in two distinct, though interdependent stages. At first, platform owners make business model choices aimed at attainment of network effects and enhanced user experience within a single market. At the second stage, platforms expand from their core by enveloping into neighboring platform markets, seeking to further enhance user-experience through cross-platform complementarities. Platform envelopment is likely to coincide or lead to envelopment by the platform firm in the neighboring market; these parallel envelopments lead to convergence of neighboring markets and emergence of supra-platform market, where diverse platform players co-habitate: compete, collaborate and engage in business model innovation.

Keywords: platforms, two-sided markets, competition, business models

INTRODUCTION

The first four out of the 50 most innovative companies in the Fast Company 2012 rankings were, respectively, Apple, Facebook, Google and Amazon (Fast Company, 2011.). All four are known as “platforms”, intermediaries in the two-sided market. While distinctive for their innovativeness and success, the “big four” are far from being the only platform companies in the market; 60 of the world’s 100 largest corporations ranked by market value earn at least half of their revenue from platform markets (Eisenmann, 2007; Eisenmann, Parker, & Van Alstyne, 2011.). The remarkable competitive advantage of platform companies, though, is also accompanied by harsh competition *within* their platform market and more recently also *across* other platform markets (Fast Company, 2011). How these companies cope with the competition and sustain their competitive advantage remains an open question.

Prior research on platform leadership has mainly focused on how platforms build value by growing their ecosystem of users on one side, and providers of complementary content on the other side within one platform market (e.g., Eisenmann, Parker, & Van Alstyne, 2006; Eisenmann et al., 2011; Evans, 2003; Gawer, & Cusumano, 2002; Gawer, 2010; Rochet, & Tirole, 2006). The economics literature on two-sided markets has evolved in understanding the dynamics of network effects in these markets, and explaining the implications of strategies that leverage such effects, like pricing and openness, on the extent of competition within the individual platform market (e.g., Caillaud, & Jullien, 2003; Clements, & Ohashi, 2005; Hagiu, 2009; Rochet, & Tirole, 2006; Rysman, 2009). Management literature on platform leadership has instead focused on strategic actions and capabilities that platforms would need to orchestrate the ecosystem and build up scale, so to become the platform leader (e.g., Boudreau, 2010; Cennamo, & Santaló, 2012; Eisenmann et al., 2006; Gawer, 2010; Gawer, & Cusumano, 2002; Schilling, 2002, 2003; Yoffie, & Kwak, 2006; Williamson, & De Meyer, 2012). However, while these studies help us understand the uniqueness of these markets, and why/how platforms can generate value to emerge as a platform leader, they offers a static picture of the overall phenomenon, failing to offer a satisfactory explanation on the evolution of platforms and their markets. This is mainly due to the sole focus on a single, “core”, platform market, while little attention is paid to the potential competition emerging from rival platforms in neighboring markets. As the example above on “the Gang of Four” shows (Fast Company, 2011), markets that hosted these four companies are becoming increasingly interdependent, with a tendency of blurring market boundaries and

convergence to a single, encompassing competitive arena. Current theory on platform leadership, by missing the underlying dynamics that lead to this phenomenon, fails to predict platform markets evolution, competition and leadership in this emerging arena.

In this study we attempt to unfold these dynamics by conceptually exploring the value creation *and* also *value capture* logics of platform strategies. This, in turn, allows us to explicate emerging interdependence among the neighboring platform markets. Our work builds on the recent efforts to understand the strategies and business models in the platform markets that span more than one market. Eisenmann et al. (2011) advance that a platform leader in a core market may generate more value for its users by incorporating the functions of a smaller platform in adjacent markets, a strategy they call “envelopment”. In essence, the platform that bundles the functions of two separated, complementary platforms will achieve efficiency and be more valuable to users. The classical example of this phenomenon is Microsoft’s Windows operating system that has, over the years, incorporated functions performed by independent smaller platforms like Netscape (for the web explorer service) or Real Player (for the management of media files). Envelopment can be seen as a special case of a bundling strategy, where the value creation is explained by direct increase in customer utility through bundling of two complementary functions. This source of value creation is not exclusive to the context of large platform entering a neighboring market hosted by a small platform (Eisenmann, 2011); for example, press abounds with the examples of envelopments by large firms directed towards a neighboring market hosted by other large firms (Economist, 2012). Envelopment in this context, though, requires consideration of possible competitive feedback, such as competitive retaliation by other platforms. We draw from multi-market contact theory (e.g., Chen, 1996; Gimeno, 1999; Smith, Ferrier, & Ndofor, 2001) and insights from the literature on two-sided platforms to extend our knowledge on the competitive implications of envelopment.

We argue that 1) envelopment of platforms into neighboring markets that host a platform of a similar size would trigger envelopment response by rival platforms in those markets, which may lead to fierce cross-market competition; 2) cross-market competition would eventually escalate to evolve into market convergence, and the creation of what we refer to as ‘supra-platform market’. We reason that as neighboring platforms expand their core functionality by entering into adjacent markets, parallel envelopment by platforms based in these adjacent markets – whether due to realization of the same opportunity or retaliation or both- may provoke a convergence of underlying, ex-ante separate markets,

thereby redefining the boundaries of the platform markets. As this amalgam of markets supersedes the individual markets, competition and value creation-value capture logics shift from the core market to the supra-platform market level, characterized by increased diversity of competitors and the nature of the competition. According to this line of thought, platform market strategies, such as envelopment, should not be considered as unconditionally positive for the firm, even when – observed in isolation- they create superior value for the customer. While envelopment may offer superior value creating potential, it may involve creation of new competitive dynamics such as rival retaliation, which may in part limit or even erode the value capture not only from this move but also over the platform as a whole.

Our study adds to the literature on platform leadership by complementing the value creation logic with the logic of value capture that results from competitive feedback that platform strategies elicit from the market. We thus better qualify the process of envelopment by looking not only at the value of a single platform in isolation (which increases with envelopment) but also at the aggregate, ensuing dynamics of platform market(s) competition, which may enhance or cut down such value. Accordingly, we offer a more integrated and parsimonious perspective of the phenomenon by complementing platform theory with multi-market contact theory.

At a more general level, our characterization of platform market evolution (and its effects on value creation and capture) may also offer valuable insights for research on industry architecture dynamics (Jacobides, Knudsen, & Augier, 2006; Pisano, & Teece, 2007) and business model innovation (Amit, & Zott, 2001; Casadesus, & Ricar, 2010). Industry architecture literature postulates that an innovator or platform may achieve competitive advantage by gaining control over the industry architecture, that is, by setting the rules and role for other firms in the different segments of the value chain contributing to the platform. Yet, it does not explain how a particular platform-centric industry architecture emerges, and considers the industry boundaries as given, failing then to account for the possibility that new industry architecture may result from convergence of previously stand-alone industries (or market segments). Value creation and value capture logics are central to literature on business model innovation. We argue that more competitive platforms are those that strike a better *balance* between value creation and value capture logics and make their strategic choices regarding cross-platform market entry in consideration of the sustainability of their competitive advantage in the resulting *supra* platform market. In short, platforms may disrupt the market and gain leadership by devising business models for positioning in the envisioned supra-platform market.

PLATFORM STRATEGIES AND PLATFORM MARKET COMPETITION

The economic peculiarity of platform markets: the indirect network effects

Platform firms represent intermediaries between the users and service providers in the markets characterized with the *indirect* network effects (Eisenmann, et al., 2006; Evans, & Schmalensee, 2007; Rochet, & Tirole, 2003). Network effects are demand-side economies of scale: the value of platform affiliation for any given affiliate depends upon the number of other affiliates (Economides, 1996; Eisenmann et al., 2011, Farrell, & Saloner, 1985; Katz, & Shapiro, 1985). While *direct* network effects are present when the value of a network (and hence the platform) increases with the number of network users, such as in the case of the fixed line telephone (Katz, & Shapiro, 1994), *indirect* network effects appear when the value that customer on one side of the platform realizes increases with the value that the customer on the other side of the platform realizes (Caillaud, & Jullien, 2003; Rochet, & Tirole, 2006; Rysman, 2009). The interconnectedness of the value creation function of the two customer groups leads to economic peculiarity of the platform markets: interrelationship between the elasticity of demand of the two groups: final users on one side, and providers of complementary content on the other side. Platforms like Google's web browser or Apple's iPhone operating system, serve users and providers by intermediating the different needs for economic transactions these groups have. *Users* consume the services of the platform and its affiliated, complementary products, and *providers* who use the platform as the intermediary to build and sell or promote their products and services to the end users. Examples of two-sided platforms include videogame consoles, operating systems, shopping malls, and credit cards among others (Parker, & Van Alstyne, 2000, 2005; Rochet, & Tirole, 2003).

A platform's success thus, largely depends on the number of customers on both sides. Beyond the relationship that exists between the economies of scale and scope and performance in regular companies (Panzar, & Willig, 1981; Teece 1980, 1982), in the platform markets this relationship is further accentuated by the value-generating loop between *users* and *providers*, leading to indirect network effects (Rysman, 2009). More specifically, the platform's value to the *providers* largely depends on the platform's installed base of *users* whom they can offer the products to, while the value of the platform to the users depends largely on the variety of products and services offered by the *providers* (Rochet, & Tirole, 2006; Roson, 2005). Value of the platform grows as the

platform matches demand from both sides (Evans, 2003); henceforth, the name of two-sided markets.

The literature has established that the presence of the indirect network effects in the market should lead to the acceleration of the competition between the platform companies operating in the same market (Rysman, 2009). Fierce competition is expected to lead to the 'winner takes it all' situation where one company acquires dominant position in the market and uses the sheer scale of its customer base to ward off new entrants. This is particularly true when, besides the strong network effects, the market is characterized by high switching costs that prevent multi-homing (single user's affiliation to multiple platforms simultaneously) and hence shelter incumbents from competition (Farrell, & Saloner, 1985; Katz, & Shapiro, 1985; Klemperer, 1987). The literature argues that to overcome entry barriers, aspiring platform providers generally must offer revolutionary functionality (Henderson, & Clark, 1990; Bresnahan, 1999) and disrupt the existing platform. For these reasons, Evans and Schmalensee (2001) observed that platform markets often evolve through sequential winner-take-all battles, where eventually superior new platforms replace old ones (Eisenmann et al., 2011).

Specific strategies of the platform companies: the value creation perspective

Platform companies have been recognized to have strategies that are peculiar to the economic conditions of the platform markets. These strategies are mainly targeted at leveraging network effects, thus expanding users base, and stimulating variety of complementary products on the providers side. One of the most prominent strategic choices of platform owners encompasses decisions on *pricing* (Caillaud, & Jullien, 2003; Eisenmann et al., 2006; Hagiu, 2005, 2009; Rochet, & Tirole, 2006). The main premise to the pricing strategy is that due to the value loop between the size of the user and provider base, price setting on one side of the market depends not only on the demand elasticity of the customers of that side of the market, but also on the demand elasticity of the customers on the other side of the market (Rysman, 2009). Thus, the decision to set the price to one side, say users, would not only encompass considerations of the price elasticity of the users, but also the value that the size of the user base will provide to the providers, thereby decreasing their price elasticity (Rysman, 2009, 2006; Weyl, 2009). The increased value for the providers and subsequent decrease in price elasticity may allow for the prices to the users to even be optimally set below the marginal costs or

become even negative. The value created to the providers by the increase in user base will indeed subsidize the low prices for the users.

Another important market strategy concerns the platform *openness* (Boudreau, 2010; Eisenmann et al., 2008; Rysman, 2009). While there is an absence of complete consensus in the literature with respect to the definition, platform openness refers to how a platform relates to the competing platforms and to providers of complementary products; whether it seeks incompatibility, compatibility, or some type of integration (Rysman, 2009). For example, payment card providers, such as visa and American Express will make their cards functional in same banks and via same POS devices (Rysman, 2009) to increase convenience and, hence, the value for the customers- both card users and merchants. Apple has opened up its mobile operating system to providers of complementary applications, but has foreclosed the possibility of hardware producers to use its iOS platform. Indeed, platforms may open up by granting access to independent providers, thus facilitating the emergence of a market for complementary components around the platform, or by giving up control over the platform itself (like for instance Linux). Openness is considered to unleash greater value. For instance, in the handheld computing systems, Boudreau (2010) finds that granting greater levels of access to independent developer firms produces up to a fivefold acceleration in the rate of new handheld device development.

Along-side more general strategic choices, openness and pricing explain how a platform, relying on the indirect effects, creates value in its 'home' market. Nevertheless, these markets do not exist in isolation and oftentimes platform owners in 'neighboring' markets extend the scope of the offering to include the functionality central to the offering of a neighboring platform. A variant of this phenomenon has been labeled as platform envelopment, and is performed by a platform into the neighboring platform markets that have overlapping user bases and employ similar components (Eisenmann et al., 2011). Platform envelopment entails entry by one platform provider into another' s market by bundling its own platform' s functionality with that of the target, so as to leverage shared user relationships and common components. According to Eisenmann et al. (2011), envelopment emerges when a platform incumbent in one market sees complementarities between his platform and the platform in an adjacent market that is typically owned by a smaller firm. To snatch that opportunity, larger platform owner integrates the smaller platform's functionalities into its core one, thus providing combined value. Platform envelopment could be thus conceived as a unique form of product bundling, where the

individual products are platform functions. If the two platforms functions are super-additional or super-modular (Milgrom, & Roberts, 1995), the joint value of the "bundled platforms" (the value of the platform after envelopment) is larger than the sum of the value of individual platforms and envelopment makes economic sense from the perspective of value generation for users. For example, Google has entered many platform markets by linking new products to its search platform, including online payment services (Google Checkout), productivity software (Google Docs), Web browser software (Chrome), and mobile phone operating systems (Android).

Competitive implications of the platform strategies: the value-capture perspective

Most of these platform strategies however, prove to be a subject to the competitive responses from other platforms. While the use of aggressive pricing is effective from the perspective of a single platform owner, thanks to the value created to the one side of the network, usually users, it makes the competition in the market much more pronounced as it triggers retaliation by the rivals. The increase in competition, in turn stimulates more aggressive pricing strategies, such as the pricing discrimination in favor of particular users that have power inside the user community. For example, video game console makers have given the largest game manufacturer advantageous contracts in order to attract games to their consoles (Eisenmann et al., 2006).

Openness decisions have relevant implications on the competitiveness as well. Providers of platforms can stimulate incompatibility with competing platforms, in order to lock in current customers and locks out competitors. For instance, the video game market has been poised with incompatibility of video games across different video gaming consoles. To a certain extent, this has been offset by publishers' relatively low marginal costs of reproducing the games in formats suitable for different platforms. When service providers seek to offset incompatibility, platforms may look to strengthen it by encouraging exclusive membership or usage. For example, game console manufacturers may contract with developers to write exclusive games (Corts, & Lederman, 2009; Lee, 2010). Typically, if one side of the market can be made exclusive, the platform can charge higher prices to the other side (Rysman, 2009).

PLATFORM COMPETITION REVISITED. SUPRA-PLATFORM MARKETS

Eisenmann clearly demonstrates that the creation of value for the users through bundling functionalities across platform markets is the main motivating factor for the envelopment strategy. While this value creation argument is strong, it is not sufficient. The considerations of the competitive repercussions – a crucial factor for value capture (e.g., Chen, 1996) – are absent, while may be outstanding in the context of neighboring markets that host platforms of similar sizes. As extant literature on the platform market already demonstrates, within the same market, every move by a platform provider results not only in the main value creating effect, but also in the secondary feedback effect through the competitive replies of the rivals. For example, deep discounts in the platform pricing strategy are likely to result in retaliative discounts from the rival. Efforts to limit openness, such as exclusive membership and points in the payment cards market, will be met by similar strategies from the rivals (Rysman, 2009).

Indeed, envelopment, strictly speaking, encompasses the expansion of a platform's functionality that would be considered central to the offering of a *smaller* platform operating in the neighboring markets. In this particular context, the implicit assumption is that the larger platform would overshadow the smaller platform in terms of the user base and therefore be able to offer preferential prices, such as offering the additional functionality for free, in order to attract customers of the smaller platform to migrate to their platform. The competitive aftermath in this context is for the platform enveloper to overtake the neighboring market while also strengthening its presence on her home market, thanks to superior, bundled, offering.

Given that the value creation logic of the platform envelopment extends beyond the specific context of larger firm enveloping into the market of a smaller firm, one may wonder about the competitive implications in the context where two equally sized platform firms from neighboring markets find themselves in the position to create superior customer value through foray into each other's market. Or in a case where a platform in the neighboring market contemplates retaliation against the platform that envelops into its market. As this would imply competition *across* the market boundaries and it is harder to implicitly assume victory of any one of the neighboring platforms on the basis of the size of their customer base, prediction of the sequential winner-takes-all competitive dynamics *within* the single markets is unlikely to hold. Instead, it would be necessary to understand the nature of the cross-market competition.

Multimarket contact (MMC) theory (e.g., Chen, 1996; Chen, & MacMillan, 1992; Gimeno, 1999; Gimeno, & Woo 1999; Fuentelsaz, & Gomez 2006; Smith et al., 2001) suggests that firms' competitive behavior may be constrained by the higher interdependence between rivals derived from their mutual contacts in overlapping markets. As innovation leaders keep entering new segments or markets, the level of multiple contacts with their rivals will likely increase and rivalry may escalate; a contingency that may well offset the benefits of economies of scope derived from related diversification. Literature on multi-market contact looks at competition and firm performance as a function of actions-reactions of firms, which in turn depend on (more or less symmetric) resource endowment of rivals as well as their market positioning. Smith et al. (2001) reviewing the field come to conclude that (1) firm level characteristics are related to action; (2) a clear relationship exists between action and reaction, with resources be the main determinant of the ability to respond; (3) industry structure influences the dynamic process, with barriers to entry playing a moderating role on the frequency of action-reaction; and (4) performance is related to action-reaction, being it greater the faster a firm act and the more it can delay reaction. All this is not accounted for by studies on platform leadership, particularly by those looking at envelopment strategy, which implicitly assume that envelopment and size would enable the focal platform to mute reaction (hence competition) from enveloped platforms of adjacent markets.

However, applying the logic of multi-market contact theory to the context of platforms, one might expect that platforms acting on neighbouring markets may react to an envelopment attack by in turn performing envelopment themselves; this would imply that the two neighbouring platforms would enter into each others' "home" markets, which would *de facto* establish multi-market contacts. *Preparation* for the envelopment could also be seen a pre-emptive 'weapon' to fire back (or react quickly to rival platforms) should they face an envelopment attack from platforms acting in these markets. In other words, platforms may undertake envelopment and add layers to their core functionality as a way to build capacity to forbear tough competition in their 'home' market by enveloping platforms coming from neighbouring markets. As Jayachandran, Gimeno, & Varadarajan, (1999:60) advance in their theoretical analysis of MMC theory, "before mutual forbearance takes effect, firms may extend their product lines and enter different markets". Since competition may well be an outcome of, and tougher under MMC (Chen, 1996), firms may decide to invest heavily in R&D and product innovation in order to quickly respond (introduce new product) to a rival's attack. Hence, platform envelopment may be conceived as both a function of innovation capability of the platform firm in response to a

value proposition for consumers, *and* multimarket competition in response to actual or anticipated rivals' moves.

Parallel envelopments

Given that the increase in customer utility through bundling of the two functionalities may be seen as a sufficient value creating condition to envelop, we argue that all platforms in the neighboring markets may see a potential value in enveloping. Recent press abounds with the examples of this parallel envelopments phenomenon (Economist, 2012).

At first, a platform company looks to establish itself in its 'home' market. While quest for the indirect network effects through pricing and openness seems to be crucial at that stage, the "get-big-fast" strategy needs to be fundamentally based on the superior functionality and customer experience, for a platform to emerge as the winner in its home market (e.g., Cennamo, & Santaló, 2012; Gawer, 2010). For example, Facebook gained network effects through attracting mutually interesting social groups (college students of top US schools), while at the same time, working hard on the user interface and even postponing the advertising (i.e., the revenue side) in order to get the users 'buy in'. Its rival Friendster managed to develop a large user base but failed in delivering good user experience due to the interruption in service, ceding the market to Facebook. Even pricing and openness, that have been primarily considered as strategies to obtain larger customer base and, hence, a tool to stimulate indirect network effects, have sometimes relied on the increase in customer utility to do so. Examples such as subsidized prices or openness are helpful in illustrating this point. After establishing itself in its home market, whether that was access to content market (Apple), information (Goggle), transactions (Amazon) or communication (Facebook), customer utility imperative (through experience or enhanced functionality) leads 'winners' to move towards functions adjacent to the ones in their home market, or to envelop. Customer utility, thus, seems to be at the core of the strategic choices that the platform owners pursue.

Given that the increased customer utility seems to be a principal motivating factor for the strategic choices and that envelopment achieves that through the super-additive or super-modular (complementary) functionalities (Eisenmann et al., 2011), one may expect that if one platform recognizes the envelopment opportunity in the neighboring market so will the platform based in this neighboring market. This would be particularly true if the platforms are of similar size or have capabilities to strike back (Chen, 1996; Smith et al.,

2001), and none of the two neighbor platforms has a clear size advantage over the other. While one may argue that platforms may be hesitant to enter each other's markets, due to the threat of retaliation by the neighbors, this will be unlikely because of two reasons. First, to make the threat of retaliation credible, a platform needs to first gain foothold into neighboring market (thus undertake substantial envelopment preparations), which will provide them with the possibility to react to aggressive competitive moves of enveloping platforms (e.g., Fuentelsaz, & Gomez, 2006; Gimeno, 1999; Jayachandran et al., 1999). Second, because of the dynamics related to the indirect network effects that characterize platform markets, building and activating the ecosystem of users and providers takes time and great effort. Platforms cannot afford the luxury of 'wait-and-see' how envelopment evolves before taking definitive action. By the time envelopment plays out, it might be too late for enveloped platforms to react. Extant research on the platform markets has showed that due to the indirect network effects, firms will be more prone to escalate competition for the sake of enhancing customer utility. Practices, such as pricing below costs and complete openness are good indicators of this tendency. Furthermore, accelerated and spiraling nature of competition that leads to the sequential 'winner-takes-all' competitive end game emphasizes the importance of acting quickly in a 'race for the market'.

We advance therefore that the companies operating in the platform markets would be more likely to expose themselves to the proactive envelopment into the neighboring market that hosts a platform player of a similar size. Furthermore, in line with multi-market contact theory, envelopment move by a platform may also trigger retaliation due to the effectuated (or anticipated) envelopment move from a neighboring platform. This retaliative envelopment move may not be directed into the core market of the attacking platform, but it may be in one of the "adjacent" markets – markets where the platform-attacker has enveloped into or has plans to envelop into in foreseeable future.

Finally, it is worth noticing that retaliative envelopments in the adjacent market will have a knock-on effect not only on the attacking platform that is interested to envelop in the adjacent market, but also potentially on the third platform whose home is in that adjacent market. Anecdotal evidence from the platform market offers support for this logic. For example, starting from the media content interface such as iTunes, Apple has started making inroads for music-based social media, such as Ping. Moving in the other direction, Facebook is partnering with music platform Spotify to connect Facebook friends that also use this popular music platform. Similarly, Apple and Google entered direct competition after Google's moves into mobile OS with Android. Apple has for long integrated Google

search and Google maps into its mobile operating system as main, default tools for search. Yet, Apple has not waited long in responding to Google's offense move. It started exploring a new way to search for info/content through its voice-based search engine Siri; and, its most recent new generation OS does not feature any longer Google maps as default. It instead runs an Apple maps application.

We formalize the aforementioned arguments in the Proposition 1 and we provide the illustration for it in the Figure 1 below.

PROPOSITION 1: *Platform envelopment of a company A into a neighboring market hosted by a company B, is likely to coincide or provoke the envelopment of the company B into the company A's home market or one of its adjacent markets.*

----- INSERT FIGURE 1 ABOUT HERE -----

Market repercussions of parallel envelopments: The supra-platform market

Motivated by increased customer utility or competitive retaliation or both, platforms in neighboring markets are likely to start to envelop into each other's markets. This systemic envelopment over multiple markets is likely to lead to changes in the competitive landscape. For once, business models and competitive strategy of platforms will start to exceed the boundaries of a single market, as all players take into consideration neighboring markets for the purpose of their business model innovations and their competitive moves (Chen, 1996; Gimeno, 1999; Fuentelsaz, & Gomez, 2006). Given this interconnectedness across the markets, in terms of the value creation functions and competitive strategies, one may question whether the competitive end game in a style of the sequential 'winner-takes-all' battles in individual market is still a likely scenario.

In line with the multi-market contact theory, platforms may understand and anticipate the competitive setting they face, and decide to avoid unwelcome tough competition by engaging in tacit collusion by force of mutual forbearance, *de facto* recognizing each others' "spheres of influence" (Gimeno, 1999; Fuentelsaz, & Gomez, 2006). In the classic markets, this is more likely when there is a higher the degree of firm similarity, in terms of resources/capabilities, and asymmetry in market positioning (firms being market leader in distinct markets; that is, having "spheres of influence"). However,

and contrary to classical markets based on which multi-market contact theory has been developed, these neighbor platform markets will be highly interdependent not just because of the multiple contacts established by the enveloping platforms, but because of the reinforcing indirect network effects between users and providers, as documented by literature on two-sided markets.

Given that the indirect network effects are platform-based and encompass the whole platform, across the functionalities and market boundaries, the envelopment to the neighboring markets will reinforce indirect network effects around the entire platform, including both its core and the adjacent functionality. Thus, what were before separate markets will no longer be independent after participating firms engage into envelopments. This will, in turn, make it hard for platforms to “preserve” a home market versus neighboring ones, and build ‘spheres of influences’ as in the case of multi-market contact firms in classical markets. Because of this, we argue that envelopment dynamics will lead to the emergence of a new market that supersedes former separated markets, redefining the competitive landscape. We call it *supra-platform market*.

So, what does this imply for the resulting competitive dynamics? Firstly, as the increased functionality is likely to increase customer utility of the enveloping platform vis-à-vis non-enveloping platform in the home market, envelopment would be likely to attract some of the users from the ‘pure’ platform competitors in the ‘home’ market towards the platform. Increase in users would make the *service providers* gravitate towards the enveloping platform as well. For example, Apple’s foray in the music platform, via iTunes, and then into the application platform, via App Store, has been very beneficial in Apple’s competition with Mac OS against other main OS provider, namely Microsoft and its platform Windows.

Indeed, due to increased customer utility, each enveloper would demonstrate higher value compared to non-envelopers (pure players) in the home market. Observing this process in isolation, one may conclude that the envelopment would lead to the tipping of the market and ‘winner takes it all’ situation. Nevertheless, we cannot consider any longer that platform competition would unfold within well-defined market boundaries; the enveloping platform has to consider competition, such as retaliative envelopment in its core market, of the enveloper from the neighboring market where she enveloped (e.g. Google vs. Yahoo, Facebook vs. MySpace). Indeed, the two envelopers are now offering similar combined functionality, which may lead to some migrations of the users from one

platform to another. This, in turn, would represent a sign of a direct competition between the two envelopers and the parallel envelopments across the boundaries of the neighboring platform markets would likely provoke the erosion of market boundaries between the two markets.

Nevertheless, neighboring platform may also consider enveloping in the market adjacent to the core platform market of the enveloping platform. While envelopment of two platforms to each other's core markets may lead to the development of similar value propositions that compete head-to-head for the same user base, the multi-platform envelopment is likely to result in the variety of different value propositions and business models. For example, platform A might combine functionalities of platforms A and B, platform B may combine B with C, and platform C may combine C with A. This may result into simultaneous envelopment of multiple neighboring platforms in each other's markets, and knock on effects with platforms adding layers to their core functionality via envelopment to respond to attacks from enveloping platforms, and cope with the ensuing redefined competition.

To summarize, platforms expanding to adjacent markets will increasingly overlap over multiple markets, which leads to blurring of the market boundaries. The supra-platform market will eventually supersede the individual markets of envelopers and 'pure players'. Not only is this new supra-platform market likely to have more competitors, but these competitors are likely to have very diverse business models and very different competitive strategies. Some of them may even emerge as competitors after previously being collaborators. The role of the players in the supra-platform market may be less easy to distinguish and define. The economics literature on platforms would predict fierce local battles in "winner-takes-all" form that get sequentially disrupted and repeated. At the same time, the mutually reinforcing force of the interrelated functionalities across markets and core competencies in different home markets will make individual platforms less exposed to other players' expansion. Thus, it reinforces the likelihood of cohabitation of different multi-functional value propositions in the supra-platform markets. This idea of cohabitation with occasional local battles is further reinforced by the position of multi-market contact theory, according to which we should witness moves and counter-moves until competitive positions over the multiple markets stabilize to the point each platform gains and recognize to each other 'spheres of influence' (that is, dominance over a core market).

PROPOSITION 2: Parallel envelopments will lead to the erosion of the market boundaries and the creation of the supra-platform market where platforms with very diverse business models co-habitate- compete, collaborate and innovate their business models.

----- INSERT FIGURE 2 ABOUT HERE -----

DISCUSSION

Parallel envelopments and supra-platform market formation in ICT industry

Our framework could be more generally applied to the analysis of the ICT market evolution. Indeed, Google, Apple, Facebook and Amazon are heavily competing in different pockets of the ICT market(s). Tension, which culminated with the mobile computing, has erased clear lines between market boundaries and upset the previous balance (Economist, 2012). Relying on the press publications and our own research of the new product and service launches between the September 1997 and December 2012, we portray the business model innovations and dynamics between these four companies, referred to as the “Gang of Four” (Fast Company, 2011), with the purpose of illustrating the parallel envelopments and the resulting emergence of the supra-platform market.

Parallel envelopments and the emergence of supra-platform market. Initially, each of the four aforementioned companies has developed and operated a powerful business model in its own market. Google developed a superior search engine that appealed to the users for its simplicity and then tied it to advertising. Facebook developed a social network platform that has been strategically rolled out to harvest the direct network effects within college communities and then coupled this service with advertising. Amazon developed capabilities to inexpensively sell and distribute physical and digital goods online, first for its own offering and then as a platform for the external sellers. Apple excelled at the design of functionally and esthetically superior consumer electronics, tying these products to the online platforms for music, books and applications. As a result of their superior offering and smart platform strategies, these companies have enjoyed dominance in their own markets while respecting mutual market boundaries for the best part of 1997 - 2003 period. For example, Google has outstripped its core competitor Yahoo, Amazon won against its brick-and-mortar competitor Barnes and Noble,

Facebook beat Friendster and MySpace and Apple considerably improved its position vis-à-vis the likes of Microsoft in software and HP in hardware. Some of the four players even enjoyed very good relationships. For example, Google's then chief executive, Eric Schmidt, sat on Apple's board from 2006 to 2009.

Today, Apple, Google, Amazon and Facebook are fiercely competing in search, online stores and access to content, operating systems, social networks and hardware (e.g. smart phones and tablets). One of the most notable examples is the competition between Apple's iOS mobile operating system, which powers the iPhone and the iPad tablet computer, and Android, Google's rival operating system, which is used by a host of manufacturers such as Samsung and HTC. It all started when Google acquired the firm that created Android in 2005, to ensure that its search engine would be included in the mobile devices (Economist, 2012). In the third quarter of 2012, Android is the OS system that powers three quarters of 181m smart phones (Economist, 2012). What Google portrayed at the time as a "way to keep options open", provoked a declaration of war for Apple that probably saw the competitive implications of this envelopment in its own market. Apple responded with entry in a number of markets adjacent to Google's core and lately also entered its core search market through Siri, voice activated personal assistant and the Apple's own mapping product. This is not just a Google-Apple competition case though. Amazon, for instance, is also entering the "maps war", having recently acquired 3-D maps startup UpNext.

Similar competitive dynamics are revealing themselves between Google and Amazon. Google used to point shoppers to Amazon, now shoppers are bypassing it and going straight to Amazon (30% of America's online shoppers begin their search for a product at Amazon (Economist, 2012). Facebook is also rumored to be working on a search product with a social spin; Mr. Zuckerberg recently said at a conference that the social network was handling "on the order of a billion queries a day already, and we're basically not even trying. (Economist, 2012)". Apple's launch of iPod (23 October 2001) sparked a battle into the realm of content; iTunes, as a online store bundled with iPod, started a rivalry with Amazon's eBook offering bundled with Amazon stores, such as Kindle. On the other hand, Amazon's Cloud Player music services (add launch date) is competing with Apple's iTunes. Facebook's strategy has been to give a social platform for the content sold by the partnering companies, such as Netflix (video on demand provider) and Spotify (music subscription provider). Google's has struggled to develop a compelling alternative to both Amazon's digital fare and iTunes. In March 2012, though, Google

brought together its offerings in music, ebooks and other areas as a part of a new online store, Google Play.

The nature and intensity of competition in the supra-platform market.

Unlike the competitive dynamics within their core markets in the 1997 - 2003 period, Amazon, Apple, Google and Facebook are now finding themselves competing with rivals that have radically different business models (Economist, 2012). Amazon is selling its Kindle e-readers and tablet computers, which use a modified version of Android, at pretty much what it costs to produce and sell them; it seems that Amazon uses its tablets to sell everything else in the world, whereas Apple used iTunes to sell iPods. Google markets its Android-powered phones, which are produced by others and Google Nexus tablets, which are made by Asus and Samsung. In 2011, though, it acquired a handset-maker, Motorola Mobility. It has recently also begun selling cheap notebooks using not Android but another of its operating systems, Chrome. Most analysts expect Google to churn out relatively cheap devices in the hope that buyers will use them to access its search and other services, thus seeing the ads on them (Economist, 2012). In the opposite direction, regarding the difference of the two business models, Apple is powering its expensive devices with free, integrated services (clouding storage, voice-based search, maps and photo applications, and the like) that would make them more appealing, and increase the user experience.

The competition in this ICT supra-market is, of course, not exclusive to the Gang of Four. One of the incumbent's from Apple's space, Microsoft, orchestrated a comeback in the search arena. Microsoft is now the second search engine in America, present on laptop as well as mobile devices, through partnership with their new mobile operating system partner, Nokia and their Surface tablet. Further, besides the parallel envelopment into each other's core markets and adjacent markets, companies are also busy defending their core markets. For example, Google is pouring money into refining the algorithms that power the search engine by buying ITA software, a firm that provides flight data and other travel information.

Nature of the competition in the ICT supra-platform market assumes a multitude of different business models, envelopment moves to innovate those business models or to compete, and innovations to protect the core markets. Besides this increase in diversity, there seems to be also an increase in the intensity of competition, in form of the 'local battles' between the four companies. In an interest to understand the intensity of the

competition, we have collected the data on product/service launches between September 1997 and December 2012. We have then classified these launches over two types of platforms (laptop/desktop based versus mobile device-based) and 11 services ranging from iOS to different services in social network, search or content arena (Books, Browsers, Cloud, Mail, Maps, Music, Operating System, Photo, Search, Social Network and Videos)

The graph presented in the Figure 3 shows the increase in the competition. As the Figure illustrates, the period between 1997 and 2003 was marked by a lack of supra-platform competition, as each of the four players has been busy establishing dominance in its core market. A couple of envelopments that took place around the 2003-2005 period, seem to have propelled the escalation of the market entries across different market segments, which has finally led to about 90% of the market segments annexed to the supra-platform market by 2012.

----- INSERT FIGURE 3 ABOUT HERE -----

Further considerations of the business model innovation- competition interplay in the supra-platform markets

While the envelopments are likely to steer the competition with neighbouring market participants, it would be useful to differentiate envelopment moves not only by the size of the platform that is hosting the market that is subject to envelopment, but also by the nature of the envelopment move. For example, platform envelopment can be seen as vertical where the platform owner looks for functionality that strengthens his position in his core platform market (consider Google search as the platform in information search adding the feature Google maps). On the other side of the spectrum, there could be a horizontal platform expansion where a platform owner steps into the adjacent or neighboring market where there is an existing platform incumbent (Google search ventures in the mobile platforms with Android). Unlike vertical layering, this horizontal platform offense is more likely to intensify competition and provoke retaliation that then leads to platform market overlapping as the platform in enters other platforms sphere of influence. In this case, besides the value of the bundling that a platform owner can get by providing higher utility to a customer, a discount factor from triggering competition from the adjacent market to the core market should be considered (as per multimarket competition theory).

The likelihood of the invasive envelopment may be a function of a value creation gained through envelopment, value capture lost due to competition, but also a value loss from lost collaborations. Here, it is instructive to remember that neighboring markets are neighboring through the virtue of their value chain proximity. This means that there is a high likelihood that prior to the platform envelopment moves, there used to be some level of collaboration between neighboring market platforms, in order to ensure that the customer has higher utility (e.g. Apple was always hosting Google apps on their iOS systems). This collaboration gets into question when one platform envelops into the other's market and some platform players are particularly cautious about this. As Marc Zuckerberg, the CEO of Facebook suggests: 'Our goal is not to build a platform. It is to be across all of them...'. (Fast Company, 2011)

As suggested, parallel envelopments over two or even more neighboring market would result in the emergence of the supra-platform market that would host companies with very diverse business models (Zott, & Amit, 2010; Teece, 2010). To start with, each of the envelopers would by virtue of coming from different market have a very different business model. Envelopment, in itself, could be considered as a form of business model innovation, where the focal firm extends the content of its transactions with the customers (Amit, & Zott, 2010). Further to that, platform owners that would find themselves in the supra-platform market may continue to change their business models in order to compete with very different envelopers- entrants from other markets. For example, Apple's move towards the development of the Maps Application could be seen as a business model extension that was provoked by the head-to-head competition with Google and the monopoly of Google in this increasingly important market segment.

The type of the business model also plays an important role in the nature of the competitive strategy that a company would play. Depending on the business model and where its core value creation or value capture activities are located, platforms might decide to play competition game in a different ways. When considering the multi-functional offerings in the supra-platform market, companies are likely to be more protective of the parts of the offering where they capture their value. For example, it was precisely the attack on the smart phone's market segment by Google that has triggered a strong retaliative response by Apple. It was after this move that Apple and Google started to aggressively envelop in each other's market where in past they collaborated. On the other hand, the diversity of the business model configurations, in this respect, could induce more proliferation of the offering and value propositions. For example, tablets offered by

Apple are premium priced, as for Apple, the hardware represents the core activity when it comes to value creation and capture, while tablets offered by Amazon are priced in a cost-effective way, as hardware represent an adjacent functionality in Amazon's business model. The nature of the competition may also change dynamically as platform owners change their configuration of activities and the points where they create value (and for whom) as well as the points where they capture value.

CONTRIBUTION AND CONCLUSION

In short, all platform strategies, including envelopment are composed of two strategic dimensions that may involve some tradeoffs: business model innovations and strategies, such as envelopment, which are aimed at value creation and an increase in the customer utility, and competitive implications of these strategies and competitive strategies themselves, that impact the value capture of the platform firm. We argue that the interplay of the two will lead towards the parallel envelopment moves by the companies in the neighboring markets and that these parallel envelopments will lead to the erosion of the market boundaries and the creation of the supra-platform market where platforms with very diverse business models compete, collaborate and innovate their business models. Thus, this article sets out to portray an encompassing picture of the business model choices and their repercussions on the competitive dynamics in the platform market, focusing particularly on the platform envelopment. Consideration of the multimarket competition literature together with the platform literature helps us shed light on the nature and dynamics of platform competition.

Besides direct contribution to the platform literature, our article speaks to two other lines of literature- business model literature and industry architecture literature. Deploying the theoretical lens of business model, defined as a system of activities and/or transactions, is very useful to disentangle more complex set of strategic and business model choices and objectives that platform owners need to balance with the objectives of the competitive strategy over time. We show that platform envelopment, which can be seen as a particular type of the business model innovation has an impact on the formation on the supra-platform markets. Nevertheless, this theoretical framework also shows how the business model proliferation and changes may be the consequence of the change in the market boundaries, particularly when the convergence of several platform markets puts firms with significantly different business models in the same competitive arena. It

would be interesting for the future study to further disentangle the dynamics between the competitive strategies and business model innovation.

Our characterization of platform markets evolution (and its effects on value creation and capture) inform on the dynamic between the business model the platform envisions for the evolving ecosystem and the industry feedback, thus helping us understanding how platform moves may lead to disintegrating existing industries and redefining new industry architectures (Jacobides, et al., 2006). The theory of industry architecture indeed explains that platforms enjoy higher bargaining power vis-à-vis their providers of complementary products that contribute to platform value generation because they hold the bottleneck assets within the industry value chain structure. In short, they control the architecture of the industry, hence they are able to capture large part of the value being generated therein. However, industry architecture literature does not explain how particular platform-centric industry architecture emerges and why some platforms more than others gain stronger control over the industry architecture and hence tend to dominate the market. Moreover, it does not account for convergence of different industries or, better, it does not account for the possibility that new industry architecture may result from convergence of previously stand-alone industries (or market segments). Our study highlights some of the dynamics that lead to industry convergence, and emergence of new industry architecture with its related value creation-value capture logics.

The proposed theory of supra-platform market competition also has numerous implications for the leaders of firms that are based in the platform market. Take for example decision to engage in the envelopment. An aspiring enveloper needs to consider first the impact that envelopment would have on the direct competition in the home market. Second, he needs to consider the likelihood of the envelopment move from the market that he would like to envelop in. Would he have superior or inferior functionality compared to rival enveloper? Taken into consideration the user base that he could over take from its direct competitor, could he enter in the platform competition with the neighbor enveloper, taking into consideration his existing and potential user base (provided that he would take over some of the users from his direct rival). Further to that, our enveloper needs to consider the likelihood of other envelopments by other neighbors in its own market and its rival market. For example, mobile payments market is becoming a market where banks compete with ICT platforms, but also retailers and telecommunication services providers. Each of the envelopment moves may strengthen or weaken the rival's position whether through a direct or indirect impact on its user base. A difference between

the horizontal and vertical moves should also be considered, particularly if that could avoid retaliative envelopments by the competitors. Finally, the competition strategy needs to be played while maintaining mindfulness of the consistent business model and the value creation imperative for the end users. In sum, platform competition strategy and business model innovation seem to be like playing interconnected games of chess on different tables and with different starting points.

Application of business model and industry architecture thinking to the platform strategies and competitive dynamics would results in a couple of other promising areas of research. For example: How do platforms design their business models in the anticipation of the competitive dynamics? What key choices are made with the ecosystem development (e.g. incentive schemes)? What governance, leadership style and culture prevails in platform firms? What is the approach to innovation in platform markers (e.g. linear planning process or 'fail forward' iterative experimentation)? All these questions seem to point to the fertile ground for academic enquiry. We hope that our paper inspires colleagues to engage in such efforts.

REFERENCES

Amit, R., & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22(6-7), 493-520.

Anonymous, 2011. *The Great Tech War Of 2012*. Fast Company. www.fastcompany.com (accessed 14.01.13)

Anonymous, 2012. *Another game of thrones: Google, Apple, Facebook and Amazon are at each other's throats in all sorts of ways*. Economist. www.economist.com (accessed 14.01.13)

Boudreau, K. 2010. Open Platform Strategies and Innovation: Granting Access vs. Devolving Control. *Management Science*, 56(10), 1849-1872.

Bresnahan, T. F. 1999. New modes of competition: implications for the future structure of the computer industry. In *Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace*. Eisenach JA, Lenard TM (eds). Kluwer: Norwell, MA; 155 – 208.

Caillaud, B. & Jullien, B. 2003. Chicken and egg: competition among intermediation service providers. *RAND Journal of Economics*, 34(2): 309–328.

Casadesus-Masanell, R. & Ricart, J. E. 2010. From Strategy to Business Models and onto Tactics. *Long Range Planning*, 43(2-3), 195-215.

Cennamo C., Santaló J. 2012. Platform Competition: Strategic Tradeoffs in Platform Markets, *Strategic Management Journal*, (forthcoming).

Chen, M. J. 1996. Competitor analysis and interfirm rivalry: toward a theoretical integration. *Academy of Management Review*, 21: 100–134.

Chen, M.J. & MacMillan, I. 1992. Non-response and delayed response to competitive moves: The roles of dependence and action irreversibility. *AMJ*, 35: 539-570.

- Clements, M.T. & Ohashi, H. 2005. Indirect network effects and the product cycle: video games in the U.S., 1994–2002. *Journal of Industrial Economics*, 53(4): 515–542.
- Corts, K.S. & Lederman, M. 2009. Software exclusivity and the scope of indirect network effects in the U.S. home video game market. *International Journal of Industrial Organization*, 27: 121–136.
- Economides, N. 1996. The economics of networks. *International Journal of Industrial Economics*, 14: 673–699.
- Eisenmann, T. 2007. Managing networked businesses: course overview for educators. *HBS note*, no.807-104. Boston, MA: Harvard Business School.
- Eisenmann, T. 2008. Managing proprietary and shared platforms. *California Management Review*, 50(4), 31-53.
- Eisenmann, T., Parker, G. & Van Alstyne, M. 2006. Strategies for two-sided markets. *Harvard Business Review*, 84(10): 92–101.
- Eisenmann, T., Parker, G. & Van Alstyne, M. 2011. Platform envelopment. *Strategic Management Journal*, 32(12), 1270-1285.
- Evans, D. S. 2003. Some empirical aspects of multi-sided platform industries. *Review of Network Economics*, 2: 191–209.
- Evans, D. & Schmalensee, R. 2002. *Some Economic Aspects of Antitrust Analysis in Dynamically Competitive Industries. NBER Chapters, in: Innovation Policy and the Economy, National Bureau of Economic Research, Inc, 2: 1-50.*
- Evans, D. & Schmalensee, R. 2007. *The Catalyst Code: The Strategies Behind the World's Most Dynamic Companies*. Boston, MA: Harvard Business School Press.
- Farrell, J. & Saloner, G. 1985. Standardization, compatibility, and innovation. *RAND Journal of Economics*, 16: 70–83.

- Fuentelsaz, L. & Gomez, J. 2006. Multipoint competition, strategic similarity and entry into geographic markets. *Strategic Management Journal*, 27: 477-499.
- Gawer, A. 2010. *Platforms, Markets and Innovation*. Northampton, MA: Edward Elgar Publishing.
- Gawer, A. & Cusumano, M.A. 2002. *Platform Leadership: How Intel, Microsoft and Cisco Drive Industry Innovation*. Boston, MA: Harvard Business School Press.
- Gimeno, J. 1999. Reciprocal threats in multimarket rivalry: staking out "spheres of influence" in the US airline industry. *Strategic Management Journal*, 20: 101-128.
- Gimeno, J. & Woo, C. 1999. Multimarket contact, economies of scope, and firm performance. *Academy of Management Journal*, 42: 239-259.
- Hagiu, A. 2005. Pricing and commitment by two-sided platforms. *The Rand Journal of Economics*, 37: 720–737.
- Hagiu, A. 2009. Two-sided platforms: product variety and pricing structures. *Journal of Economics and Management Strategy*, 18: 1011–1043.
- Henderson, R., & Clark, K. 1990. Architectural innovation: the reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 35: 9–30.
- Jacobides, M. G. & Billinger, S. 2006. Designing the boundaries of the firm: From "make, buy, or ally" to the dynamic benefits of vertical architecture. *Organization Science*, 17(2), 249-261.
- Jacobides, M. G., Knudsen, T. & Augier, M. 2006. Benefiting from innovation: Value creation, value appropriation and the role of industry architectures. *Research Policy*, 35(8), 1200-1221.
- Jayachandran, S., Gimeno, J. & Varadarajan, P.R. 1999. Theory of multimarket competition: A synthesis and implications for marketing strategy. *Journal of Marketing*, 63(3): 49.

Katz, M. & Shapiro, C. 1985. Network externalities, competition, and compatibility. ***American Economic Review***, 75: 424–440.

Katz, M.L. & Shapiro, C. 1994. Systems competition and network effects. ***Journal of Economic Perspectives***, 8: 93–115.

Klemperer, P. 1987. Markets with consumer switching costs. ***Quarterly Journal of Economics***, 102: 375-394.

Lee, C., Venkatraman, N., Tanriverdi, H. & Iyer, B. 2010. Complementarity-Based Hypercompetition in the Software Industry: Theory and Empirical Test, 1990-2002. ***Strategic Management Journal***, 31(13), 1431-1456.

Milgrom, P. & Roberts, J. 1995. Complementarities and Fit - Strategy, Structure, and Organizational-Change in Manufacturing. ***Journal of Accounting & Economics***, 19(2-3), 179-208.

Panzar, J. & Willig, R. 1981. Economies of Scope. ***American Economic Review***, 71(2), 268-272.

Parker, G. & Van Alstyne, M. 2000. Information complements, substitutes, and strategic product design. Workshop on Information Systems and Economics, Charlotte, NC. Available at: [http://ssrn.com/abstract= 249585](http://ssrn.com/abstract=249585) (accessed 10 July 2010).

Parker, G. & Van Alstyne, M. 2005. Two-sided network effects: a theory of information product design. ***Management Science***, 51: 1494–1504.

Pisano, G. P., & Teece, D. J. (2007). How to capture value from innovation: shaping intellectual property and industry architecture. ***California Management Review***, 50(1), 278-296.

Rochet, J. & Tirole, J. 2003. Platform competition in twosided markets. ***Journal of the European Economic Association***, 1(4): 990–1029.

Rochet, J.C. & Tirole, J. 2006. Two-sided markets: a progress report. ***Rand Journal of Economics***, 37: 645–667.

- Rysman, M. 2009. The Economics of Two-Sided Markets. *Journal of Economic Perspectives*, 23, 125-144.
- Schilling, M.A. 2002. Technology success and failure in winner-take-all markets: the impact of learning orientation, timing, and network externalities. *Academy of Management Journal*, 45: 387–398.
- Schilling, M.A. 2003. Technological leapfrogging: lessons from the U.S. video game console industry. *California Management Review*, 45(3): 6–32.
- Smith, K., Ferrier, W. & Ndofor, H. 2001. Competitive dynamics research: Critique and future directions. In HFH, Chapter 11: 315-361.
- Teece, D. 1980. Economies of Scope and the Scope of the Enterprise. *Journal of Economic Behavior & Organization*, 1(3), 223-247.
- Teece, D. 1982. Towards an Economic-Theory of the Multiproduct Firm. *Journal of Economic Behavior & Organization*, 3(1), 39-63.
- Teece, D. J. 2010. Business Models, Business Strategy and Innovation. *Long Range Planning*, 43(2-3), 172-194.
- Weyl, E. Glen. 2009. *The Price Theory of Two-Sided Markets*. Working paper, University of Chicago Working Paper Series.
- Williamson P.J. & De Meyer A. 2012. Ecosystem Advantage: How to successfully harness the power of partners. *California Management Review*, 55(1): 24–46
- Yoffie, D.B. & Kwak, M. 2006. With friends like these: the art of managing complementors. *Harvard Business Review*, 84(9): 88–98.
- Zott, C., & Amit, R. 2010. Business Model Design: An Activity System Perspective. *Long Range Planning*, 43(2-3), 216-226.

FIGURES

Figure 1. Parallel envelopment moves in platform markets

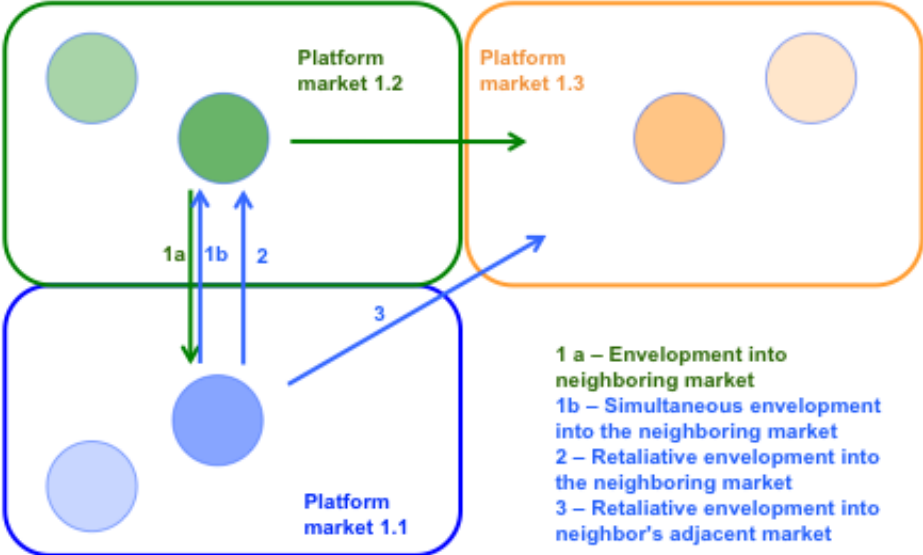


Figure 2. Process of market boundary erosion due to parallel envelopment and resulting emergence of supra-platform market

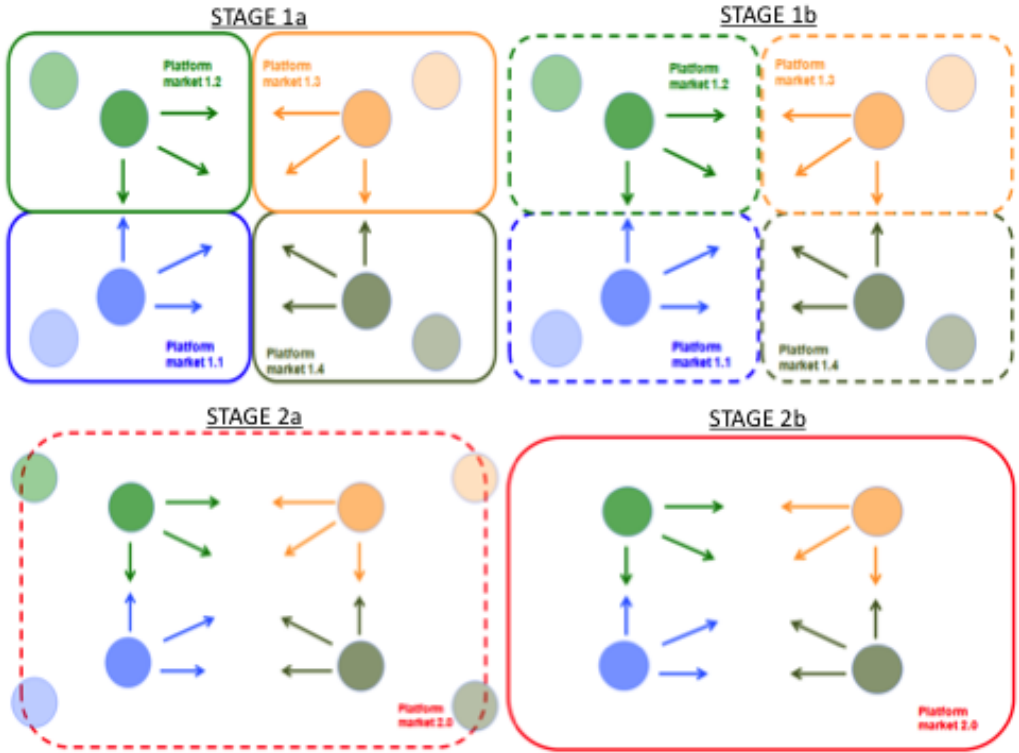
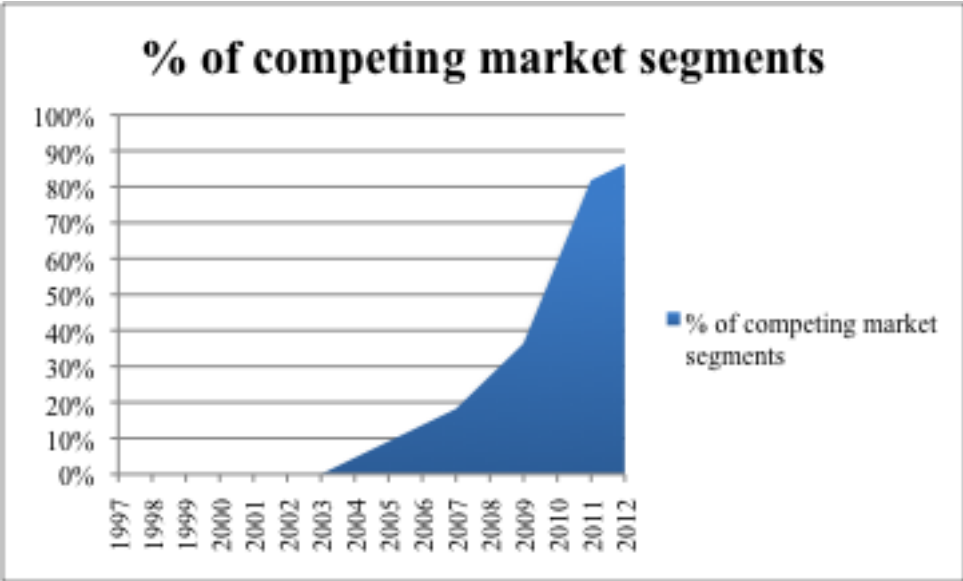


Figure 3. Exponential increase in the supra-platform market



Campus Barcelona - Pedralbes

Av. Pedralbes, 60-62
08034 Barcelona (España)
T. +34 932 806 162
F. +34 932 048 105

Campus Barcelona - Sant Cugat

Av. de la Torreblanca, 59
08172 Sant Cugat del Vallés
Barcelona (España)
T. +34 932 806 162
F. +34 932 048 105

Campus Madrid

Mateo Inurria, 25-27
28036 Madrid (España)
T. +34 913 597 714
F. +34 917 030 062

Campus Buenos Aires

Av. del Libertador, 17175
Becar-San Isidro (B1643CRD)
Buenos Aires (Argentina)
T. +541 147 471 307

Global Center Munich

www.esade.edu/munich

Global Center Sao Paulo

www.esade.edu/saopaulo

www.esade.edu