

ECOSYSTEM THEORIES OF HARM: WHAT IS BEYOND THE BUZZWORD?



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This paper discusses the “new” ecosystem theories of harm arising from digital mergers, and the practical challenges and implications of the perceived gaps in the current antitrust enforcement framework. As explained in this paper, digital ecosystems tend to be complex and comprise features that are different from traditional conglomerate businesses. However, from an economics perspective, ecosystem theories of harm are not fundamentally different from conventional conglomerate effects concerns. While empirical challenges faced to date in assessing relevant concerns may have motivated the debate on the sufficiency of the current analytical framework, it is necessary to be mindful that an overly aggressive enforcement approach, in particular, toward entrenchment of market power, may lead to significant chilling effects on dynamic competition and suppress pro-competitive innovations, and ultimately an undesirably lower bar in concluding anti-competitive harms.

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Competition concerns in relation to digital ecosystems have gained noticeable attention in recent years. The change of tide in enforcement around the world has led to some novel competition concerns in mergers and acquisitions involving large digital platforms with established ecosystems.

At the same time, the development of digital ecosystems reflects the increasing digital transformation in modern society, which not only provides innovative paths for businesses to achieve economies of scale and/or scope, but also to improve the quality of products and services to better fulfil changing consumer expectations. Although ecosystems are widely researched in the study of business management², the understanding of the competitive dynamics of digital ecosystems and the level of sophistication in empirical analyses under the current framework for competition enforcement has room for improvement.

A digital ecosystem is often organized around one or a few core products and services, and digital service providers (or platform operators) tend to leverage their core technology and user base to enter adjacent markets. Digital service providers often utilize technology to integrate or connect different products and services, where data and algorithmic capabilities can be shared and optimized to achieve efficiencies and improve user experience and/or quality of services, as well as to create dynamic revenue generating mechanisms.

Antitrust concerns in this regard tend to arise from the economic relationship between different products and services operated or influenced by a digital platform. This is similar to that of traditional conglomerate businesses, except that the latter tend to focus on operational efficiency, capital allocation, and risk diversification across different industries.³

Different from many traditional conglomerates, however, once a digital infrastructure is in place, the marginal cost of production, i.e. serving additional customers, is often very low, allowing these ecosystems to expand their scale (including extension of services into adjacent areas) rapidly and globally.

Value creation in digital ecosystems, large or small, often hinges on the interaction between different types of economic agents connected through the system (for example, users, advertisers, content creators, app developers, and others), and the importance of data integration and algorithmic application to user experience and network effects. In particular, the value of a digital ecosystem may be derived from complementary services which exhibit network effects, namely, direct network effects when the value of a product or service increases as the number of users increases, and/or indirect network effects via the interaction between users on opposite sides of the platform. It may also be driven by economies of scope due to common technologies and informational flow, for example, data sharing and algorithmic enhancement.

I. ECOSYSTEM THEORIES OF HARM IN DIGITAL MERGERS

In the past, mergers and acquisitions involving firms offering complementary or independent goods and services have been considered less likely to lead to substantial lessening of competition (hereafter “SLC”) than so-called horizontal mergers. Instead, such transactions often give rise to inherent efficiencies. However, competition authorities nowadays are increasingly concerned about non-horizontal transactions involving digital players, in particular when acquisition of firms offering products and/or services that are interdependent with the core product and/or service offered by a leading platform, where key concerns rest upon whether such acquisitions may result in the entrenchment of any pre-existing market dominance or the creation of barriers to entry in one or more of the markets comprising the ecosystem.

Broadly speaking, ecosystem theories of harm tend to focus on the impact of a transaction on user base, or data consolidation/enhancement of algorithmic capabilities, or technical interoperability.⁴ Such concerns are often compared to the traditional portfolio effects theory of harm in relation to a conglomerate merger, mainly because of the complementarity of products/services offered by the parties. That being said, the

2 Tsujimoto M., Y. Kajikawa, J. Tomita & Y. Matsumoto (2018), ‘A review of the ecosystem concept - Towards coherent ecosystem design’, *Technological Forecasting and Social Change*, 136, 49-58.

3 In the context of a traditional conglomerate business, the economies of scope are mainly driven by the sharing of (physical or intellectual) infrastructure and/or supply chain, as well as corporate services (such as HR, finance etc.), which then lead to lower costs and benefit customers.

4 In the context of an abuse of dominance, the ecosystem established by a leading digital platform may have significant informational advantage, hence makes new entrants or expansions more difficult. Such concern, however, needs to be proven with empirical evidence. It is assertive to claim that smaller digital players cannot compete effectively in niche markets against large platforms with sophisticated ecosystems. The informational or data/algorithmic advantage stems from an established ecosystem has to be detrimental to rivals to the extent that such an advantage is not easily replicable, and without which, rivals will not be able to compete effectively in the markets where they operate. The mere size and sophistication of the ecosystem is not sufficient to draw such a conclusion.

special features of digital ecosystems mean that the mechanism of foreclosure may be different from that of the conventional portfolio effects concern, as such, the empirical analyses should be designed in the context of case-specific facts and evidence.

For instance, the degree of complementarity among products and services in a digital ecosystem is often related to users' behavior (for example, heterogeneous preferences imply that differentiated products and services could be seen as complements by some users, but substitutes by others) and network effects (i.e. complementarity driven by network effects where users' loyalty to a particular product or platform may increase their willingness to try adjacent products or services). Although user homing preferences, namely single-homing *versus* multi-homing, are often considered to be an indicator of the significance of network effects,⁵ it is still challenging to estimate the degree of network effects empirically, and the critical mass required for successful entry and/or sustainable expansion.⁶

From a supply-side perspective, platforms tend to compete with differentiated products and services; successful newcomers often specialize in a niche area and gradually expand into adjacent segments. For example, Douyin (the Chinese branding of TikTok) started as a short-video sharing platform, but is now viewed as a social media platform with all forms of content sharing and social media functionalities, as well as livestreaming and associated e-commerce services.^{7,8}

Over time, we see more and more functionality overlaps across different digital platforms, but it is not reasonable to expect an exact competitive replication of an existing digital platform or ecosystem. Hence, the conventional wisdom relying on rivals' ability to offer a competing portfolio of products and services to mitigate portfolio effects concerns would need to be amended to evaluate different offers that ultimately require the same user attention to succeed in a digital world.

Further, different from the conventional conglomerates, many consumer-facing digital services are offered free of charge to consumers, and it is empirically challenging to measure the quality of services. As such, conventional price-based empirical tools may not be directly applicable to the evaluation of the merger-specific efficiencies arising from data aggregation, algorithmic enhancement or other technological improvements which would benefit consumers in the short term. This short-term complexity is compounded further by increased uncertainty over the long term.⁹

Moreover, a digital service provider can establish or enrich its digital ecosystem by setting up its own subsidiary entities in segments where expansion is anticipated, or it could form contractual arrangements/business alliances with independent third-party entities that are already active in those segments, or undertake a hybrid approach. The design of an ecosystem could be driven by various factors, such as the strategic vision of the company, the nature of competition in all affected markets, and optimal monetization model evolving over time. Importantly, each approach has its pros and cons, and the "superiority" of one over the other, from a competition perspective, simply cannot be assumed.¹⁰

Conceptually, the existence of a digital ecosystem may become problematic, regardless of the approach adopted, in the event rivals offering stand-alone products and services can no longer compete effectively, and/or barriers to entry and expansion increase as a result of an ever-expanding digital ecosystem.

Instead of focusing on potential concerns arising from digital ecosystems where all products and services are owned by the same company, antitrust enforcement needs to factor in different approaches underpinning the structure of a digital ecosystem.¹¹ Identifying and assessing the relevance of digital ecosystems via collaboration (not ownership) is also a necessary component of a robust assessment of any ecosystem concerns. The implications are twofold: on the one hand, external collaborations may lead to lock-in of third parties to a particular leading plat-

5 Higher levels of multi-homing tend to reduce the impact of network effects on contestability – see e.g.: Rochet, J. C. & Tirole, J., Two-Sided Markets: A Progress Report, *RAND Journal of Economics*, 2006, 37(3), 645; Rochet, J.C. & Tirole, J., Platform Competition in Two-Sided Markets, *Journal of the European Economic Association*, 2003, 1(4), 990.

6 Identification of direct and indirect network effects is made difficult by inherent econometric simultaneity problems, particularly where users on each side of the platform act strategically, and with foresight of future outcomes and payoffs. See e.g.: Bruno Jullien, Alessandro Pavan & Mark Rysman, 'Two-Sided Markets, Pricing & Network Effects', in *Handbook of Industrial Organization IV* (Kate Ho, Ali Hortascu & Alessandro Lizzeri), Ch7, p558-579.

7 See <https://www.woshipm.com/it/5759368.html>.

8 See <https://36kr.com/p/1569422282182277>.

9 The definition of consumers could vary in a digital ecosystem. For example, YouTube viewers could also be a content creator, but intuitively, depending on the role played by individual users, their demand preference and incentives to switching would also differ.

10 CMA & AdIC, 'The Economics of Open & Closed Systems' (16 December 2014).

11 ACCC, 'Expanding Digital Platform Ecosystems' (September 2023, DPSI Interim Report No. 7), Ch3.

form, which may undermine the competitiveness of rival platforms if the services offered by such third parties are necessary and difficult to replace; on the other hand, smaller platforms could also utilize third parties' capabilities instead of building their own in establishing competitive products/services to compete with a leading platform.

The above being said, the complexities of digital ecosystems, in reality, have not hindered practical evaluation of concerns involving ecosystems up to now. In particular, the European Commission's *Booking/eTraveli* decision signals a shift in its approach to assessing mergers involving ecosystems. The theory of harm in that case hinges on the likelihood of users of the acquired flight OTAs also purchasing the services of the acquirer's hotel OTAs, hence further strengthening Booking's alleged dominance in the market for hotel OTAs.¹²

The proposed acquisition of eTraveli by Booking may be seen as the first transaction blocked on the basis of an ecosystem theory of harm (i.e. flight OTAs help strengthening Booking's hotel OTAs business, and harm consumers who are locked in the Booking ecosystem) instead of the traditional foreclosure via leveraging of market power. However, the fundamental mechanisms underpinning such a concern are not materially different from various forms of foreclosure concerns that have been raised in numerous digital mergers in recent years, and competition authorities were able to assess such concerns using the "ability-incentive-effects" framework.

For example, while the *Google/Fitbit* acquisition was cleared by the European Commission, conditions on how Google could use Fitbit's data were imposed to alleviate data related theories of harm (as summarized in the table below). These conditions included forbidding Google from using Fitbit data in its advertising products and requiring Google to keep Fitbit data separated from other data used in advertising.¹³

Table 1: Merger concerns about strengthening of core products and services

Transaction	Year	Jurisdiction	Outcome	Concerns	Market of concern	Specific theories of harm
Booking-eTraveli	2023	EC	Prohibited	Entrenchment of dominance	Online travel booking	The acquisition of eTraveli's flight OTAs may strengthen Booking's dominance in hotel OTAs
Microsoft-Activision	2022	EC	Remedied	Market tipping/inciency	Cloud gaming	Acquisition of Activision's game portfolio may cause Microsoft to obtain a dominant position in incipient cloud gaming markets
		CMA	Remedied			
Meta-Within	2022	FTC	Litigated	Market tipping/inciency	Virtual reality	Acquisition of Within's virtual reality app portfolio may cause Meta to obtain a dominant position in incipient virtual reality markets
Google-Fitbit	2020	EC	Remedied	Entrenchment of dominance	Personalized advertising	The addition of Fitbit's user data may materially improve Google's ad offerings, making it more difficult for rivals to match Google's services, and others (articulated in classical foreclosure theory of harm terms)

Source: RBB summary based on published decision or case documents.

Meta-Within (FTC Matter No 221 0040) *FTC Complaint* of 11 August 2022, available at: https://www.ftc.gov/system/files/ftc_gov/pdf/D09411MetaWithinComplaintPublic.pdf.

Microsoft-Activision CMA Phase 1 Decision of 12 October 2022, available at:

https://assets.publishing.service.gov.uk/media/634536048fa8f5153767e533/MSFT.ABK_phase_1_decision_-_1.09.2022.pdf.

It seems that any digital mergers involving parties sharing a user base, data, or other important asset in a way that provides a potential advantage over rivals or raises barriers to entry and expansion may be considered problematic by competition authorities. However, to undertake

¹² European Commission, 'Mergers: Commission prohibits proposed acquisition of eTraveli by Booking' IP/23/4573 (Brussels, 25 September 2023), available at https://ec.europa.eu/commission/presscorner/detail/en/ip_23_4573.

¹³ *Google/Fitbit*: European Commission Decision (Case M.9660) of 17 December 2020, available at https://ec.europa.eu/competition/mergers/cases1/202120/m9660_3314_3.pdf.

rigorous case-specific assessments, it remains necessary to identify the exact sources and mechanisms of harm to competition, as the competition authorities have done in the past. (Re-)classification as so-called ecosystem theories of harm does not, of itself, contribute to additional understanding or absolve the competition authorities of such responsibility.

II. PRACTICAL CHALLENGES AND IMPLICATIONS

What might have motivated the discussion on perceived gaps in the existing analytical framework even though this framework has been successfully applied to digital mergers involving ecosystems?

First, the complexity of the interdependencies between products and services connected through an ecosystem raises the question of the relevance of market definition. Under the current framework, market definition is an important thought process, and a well-defined market can help identifying the closest competitors to the merging parties.¹⁴ In the context of digital products and services, however, the exact boundary of the relevant markets can be blurred and often evolves over time.

From a demand-side perspective, heterogeneity of user preferences often result in differentiated products and services, and dynamic evolution of users' behavior overtime could lead to changes in the business models adopted by platforms for value creation and monetization. These, however, do not preclude differentiated products and services with different monetization mechanisms from falling into the same relevant market. For example, the traditional e-commerce platforms essentially function as a digital shelf space for product display, with consumers proactively searching and comparing the products on offer, in pursuit of clear consumption objectives. In contrast, the newly emerging innovative e-commerce models have often focused on guided consumption through recommendations via livestreaming, short videos, and other forms of content sharing. As concluded by SAMR in its decision on Alibaba's abuse of dominance, those innovative e-commerce platforms fulfil the same basic needs of consumers (i.e. to fulfil their consumption needs online) and merchants (i.e. to promote product and services online and to generate revenue sales), hence were considered in the same product market as traditional e-commerce platforms.¹⁵

From the supply perspective, technological improvements or major technical developments could lead to unexpected forms of products and services emerging in competition with incumbents. For example, the recent development of AI has not only led to new ways of searching (e.g. ChatGPT), but also has helped enhance existing search results (e.g. AI-Powered search engines), both of which represent alternative tools to Google Search.

In short, practical challenges in defining the relevant markets involving digital players might be one of the reasons why competition authorities find it hard to fit ecosystem theories of harm neatly into the traditional categorization of merger theories of harm based on the economic relationship between the products and services offered by the merging parties, namely complements, substitutes, or unrelated. This may explain the recent change in the EU approach. In particular, the EC's concern relating to the growth of Booking's travel services ecosystem represents a clear shift from more traditional non-horizontal concerns of foreclosure or leveraging market power across well-defined markets.

That being said, the enforcement experience up to now suggests that it is possible to define relevant markets for most digital transactions, or at least identity reference markets for the purpose of the competition assessment. The revised EU guidelines on market definition provide sufficient flexibility in this regard.¹⁶ Perhaps the real change needed is to focus on the facts and evidence regarding the evolution of digital ecosystems, as well as the ever-changing competitive dynamics between digital players in assessing the relevant markets in specific cases.

Second, the notion that digital mergers involving large platforms with an ecosystem may have a broader impact in terms of entrenching the firm's market power is likely to be controversial. Indeed, competition concerns in relation to the entrenchment of market power are not novel, but have rarely been pursued until recent times. Such concerns may underpin a general attitude nowadays that leading digital platforms may have obtained substantive market power in the markets of their core products and service, and acquiring a firm in an adjacent segment may further enhance such market power, to the extent that it would prevent future entrants, further decreasing the likelihood of dynamic competition over the long run.

However, one should not forget the sources of efficiencies underpinning digital ecosystems, which are often related to the integration of data and technological capabilities. As such, there is an inevitable trend in the transformation of ecosystems in the direction of expanding col-

¹⁴ Commission Notice on the definition of the relevant market for the purposes of Union competition law, 8 February 2024, section 1.2.

¹⁵ SAMR decision in Chinese can be found with the following link: https://www.samr.gov.cn/xw/zj/art/2023/art_4966dda92ab34c398615f5878c10c8f1.htm.

¹⁶ Commission Notice on the definition of the relevant market for the purposes of Union competition law, 8 February 2024, section 1.2 and 4.4.

laboration between economic agents. An ecosystem operator may be incentivized to establish a collaborative rivalry relationship with third-party companies, i.e. they may compete aggressively in certain markets, but collaborate in other areas to allow mutual benefits.

An aggressive enforcement on the entrenchment of market power without a substantial lessening of competition in the short run could lead to an efficiency offence type of theory of harm, which would threaten chilling effects on innovation and dynamic competition.

If the ultimate concern hinges on rivals' inability to innovate in the long run, we face a set of different issues, including: where innovation is likely to come from; whether it is sufficient to have various successful ecosystems that overlap in some business activities in order to ensure leading platforms in particular markets will continue to innovate to the benefit of consumers; and, the extent to which merger-specific efficiencies in the short run might be sufficient to mitigate such concerns. This long run innovation concern, however, is not to be confused with the typical short run competition concerns. More importantly, such a concern needs to be balanced against pro-competition efficiencies that may arise from a digital merger.

Overall, merger analyses are facts driven, whether or not the parties involved operate digital ecosystems. Economists are used to assessing case-specific concerns whilst factoring in any practical complexities. It has always been the case and digital mergers are no exception.

While it is important to continue improving our understanding of digital ecosystems, as well as the ever-changing competitive dynamics between digital players, and to apply facts-based analyses, those are empirical challenges, and should not be viewed as legitimate justifications for overly emphasizing the entrenchment of market power in a way that ultimately risks an undesirable lowering of the standard of proof in enforcement.



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