Monopolkommission

An economic test concept for digital ecosystems

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Chapter III

An economic test concept for digital ecosystems

Summary

K1. Digital ecosystems are characterised by actors/services/platforms/products being in a compatible and complementary relationship with one another. The actors are interconnected through the common use of certain standards and possibly also datasets and can offer added value across products, services, markets or sectors. **Digital ecosystems differ conceptually from regular digital platforms and networks and should therefore be identified using specific criteria. The Monopolies Commission considers that a clear concept would enable the focus to be placed on the real problems and should already be used now within the framework of the applicable legislation.** Against this background, the question arises as to what an economic analysis of digital ecosystems should be like. **An economic test concept for identifying digital ecosystems using three test steps is proposed: 1) examine systemic factors; 2) determine ecosystem power; and 3) identify potential for discriminatory and leveraging practices**.

K2. Digital ecosystems pose particular risks to competition that go beyond the threats posed by simple digital network and platform services. Thus, the Monopolies Commission recommends that section 19a of the German Act against Restraints of Competition (GWB) should be targeted explicitly to deal with digital ecosystems. In order for the criteria of section 19a (1) GWB to be in a recognisable context that is aligned with the economic concept of digital ecosystems, the Monopolies Commission recommends that it must be shown how these criteria relate to one another and how they jointly affect the creation and expansion of economic power (i.e. ecosystem power).

K3. The legislator should draft section 19a (1) GWB to ensure that a comprehensive analysis of non-generic complementarities is conducted. These lead to rule-setting power for the orchestrator of a centralised ecosystem, create incentives for leveraging and discriminatory practices, create significant dependencies for third-party undertakings and, from an economic perspective, make the key difference between the phenomenon of digital ecosystems and regular digital services, networks and platforms.

K4. The Monopolies Commission therefore recommends that Section 19a Paragraph 1 GWB should be clearly aligned with the analytical framework corresponding to the state of economic literature in order to be able to adequately identify and address digital ecosystems and the resulting special threats to competition. **The Monopolies Commission proposes that the list of criteria in Section 19a Paragraph 1 Sentence 2 GWB should be revised accordingly: "*In determining the paramount significance of an undertaking for competition across markets, account shall be taken in particular of: 1. the non-generic complementarities between actors, data, services, platforms and products of the digital ecosystem, 2. the existence of autonomous actors with a common value proposition for consumers, 3. the existence of a modular organizational structure with a central ecosystem operator.*"** The three criteria proposed would anchor the ecosystem concept in Section 19a Paragraph 1 GWB. This contributes to a more concrete position as an addressee of that provision and enables a more precise economic identification of digital ecosystems. **The Monopolies Commission is of the opinion that a clear**

concept enables a focus on the actual problems and that, regardless of the legislative implementation, the scope of the provision should already be focused on this, especially in the further application of the provision, including Section 19a Paragraph 2 GWB.

1 Introduction

1. Recent years have impressively demonstrated how undertakings in the digital economy, alongside individual platform services, have developed entire ecosystems, in which every additional service or product offer creates additional complementarities within the digital ecosystem and promotes lock-in effects for users, while at the same time strengthening the position of the ecosystem orchestrator. Concomitant structural economic effects that favour market concentration cause significant problems for competition, which can put the openness of digital markets at long-term risk.

2. Thus, it is vital for competition authorities to be able to identify these digital ecosystems at an early stage and to understand how they work – both in the context of ex-ante rules and ex-post control. Interestingly, the ecosystem concept has not yet been reflected in the competition economics literature – beyond the question of a specific theory of harm – although it is already established in the economic management and information systems literature. It is also noteworthy that neither the Digital Markets Act (DMA)[1] nor section 19a GWB is explicitly designed to address digital ecosystems; instead, the DMA is based on certain digital platform services and section 19a GWB is based on undertakings that operate across markets. However, current developments in digital markets suggest that it is becoming increasingly necessary to specifically address digital ecosystems.

3. The norm addressees of the DMA are digital platforms that have a gatekeeper position as providers of core platform services. A gatekeeper status is assigned to undertakings under Article 2(1) DMA as providers of core platform services, and these are listed enumeratively in the Regulation (Article 2(2) DMA).[2] The Regulation defines "gatekeeper"[3] on the basis of Article 3(1) DMA; this entails that a) it has a significant impact on the internal market, b) it provides a core platform service which is an important gateway for business users to reach end users and c) it enjoys an entrenched and durable position or it is foreseeable that it will enjoy such a position in the near future. In addition, specific quantitative presumption thresholds (Article 3(2) DMA) or qualitative criteria (Article 3(8) DMA) must be met. However, this approach

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1 Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act), OJ L 265 of 12 October 2022.

2 According to this provision, core platform services are online intermediation services, online search engines, online social network services, video-sharing platform services, number-independent interpersonal communications services, operating systems, cloud computing services and online advertising services.

3 According to the economic literature, a "gatekeeper" is an actor that controls information flows and access to information and users, and structures the digital environment. According to this definition, a digital platform may be a gatekeeper platform service if it manages to control access to end users and is thus without any (practical) alternative for business users in the absence of multihoming or switching on the part of relevant groups of end users, if they would like to reach these end users. Hence, the degree of control depends on the incentives and on the ability of the groups of users (business users and end users of the platform service) to engage in multihoming and switching, and increases with the number of users who engage in singlehoming. Thus, a gatekeeper position does not necessarily require a large market share, but only a high degree of control over access to a relevant group of users. See: Lynskey, O., 2017, "Regulating Platform Power" LSE Law, Society and Economy Working Papers 1/2017, pp. 9-10; Armstrong, M./Wright, J., 2007, "Two-sided Markets, Competitive Bottlenecks and Exclusive Contracts." Economic Theory 32(2), pp. 353-380.

bears the risk of covering too few or too many undertakings, and possibly the wrong ones, on the basis of the presumption thresholds of Article 3(2) DMA, since only sheer size and scope are taken into account.[4] In addition, digital ecosystems pose particular risks to competition that go beyond the threats posed by simple digital network and platform services.

4. The new norm of section 19a GWB created by the 10th Amendment to the German Act Against Restraints to Competition is ambiguous regarding the question as to who is actually a norm addressee.[5] On the basis of the current design of the norm, it may cover undertakings that operate a network, a platform or other services. The legislator created a new power category with section 19a GWB, but it is not clearly distinguishable from the GWB's other power categories. However, the identification of "undertakings with paramount significance for competition across markets" in accordance with section 19a (1) GWB involves significant consequences such as a reversal of the burden of proof (section 19a (2) sentences 2 and 3 GWB) and potentially far-reaching behavioural obligations in accordance with section 19a (2) sentence 1 GWB. Thus, from an economic perspective, the question arises as to the reasonable orientation and application and further development of such a norm.

5. This chapter therefore pursues the question as to how the phenomenon of "digital ecosystems" is to be understood from an economic perspective and what criteria the legislator should set for a concept to test it. First, the phenomenon of "digital ecosystems" is explained (section 2). On this basis, the current criteria for identifying "undertakings with paramount significance for competition across markets" in accordance with section 19a (1) GWB are discussed (section 3). Then, an economic test concept for digital ecosystems (section 4) and finally new criteria for section 19a (1) GWB are proposed (section 5), in order to be able to identify digital ecosystems as precisely and comprehensively as possible.

2 The phenomenon of digital ecosystems in economics

6. In economics, ecosystems are viewed as communities of cooperating undertakings that jointly produce a good, a service or a solution and further develop their products within the framework of a common vision – a distinction is made here between product-based and actor-based ecosystems:[6]

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4 Monopolies Commission, 2021, "Special Report 82: Recommendations for an effective and efficient Digital Markets Act", https://www.monopolkommission.de/images/PDF/SG/sr_dma_fulltext.pdf.

5 Monopolies Commission, 2020, "10th amendment to the German Act against Restraints of Competition – meeting challenges in digital and regional markets, Policy Brief Issue 4, Bonn.

6 Jacobides, M.G./Cennamo, C./Gawer A., 2018, "Towards a theory of ecosystems", Strategic Management Journal 39(8), pp. 2255-2276; Jacobides, M.G./Cennamo, C./Gawer A., 2024, "Externalities and complementarities in platforms and ecosystems: From structural solutions to endogenous failures", Research Policy 53(1), 104906. Basic works on this are: Iansiti, M./Levien, R., 2004, The keystone advantage: What the new dynamics of business ecosystems mean for strategy, innovation, and sustainability, Harvard Business School Press; Moore, J.F., 2006, "Business ecosystems and the view from the firm", Antitrust Bulletin, 51(1), pp. 31-75; Kapoor, R./Lee, J.M., 2013, "Coordinating and competing in ecosystems: How organizational forms shape technology investments", Strategic Management Journal 34(3), pp. 274-296; Adner, R., 2017, "Ecosystems as structure: An actionable construct for strategy", Journal of Management, 43(1), pp. 39-58; Kretschmer, T./Leiponen, A./Schilling, M./Vasudeva, G., 2022, "Platform ecosystems as meta-organizations: Implications for platform strategies",

- Within a "*multi-product ecosystem*", a range of mutually compatible products or mutually reinforcing services is offered that together create a novel or attractive solution, e.g. operating system + app store + web browser + voice assistant.
- In a "*multi-actor ecosystem*", a high-performance ecosystem orchestrator provides a platform for a number of partners and providers of complementary services/products in order to generate added value to end users, e.g. interplay of app store operator and app developers.

7. Typically, ecosystem orchestrators such as the Big Tech companies combine both types of ecosystems. Whereas a multi-product ecosystem enables end user loyalty to be gained, thereby increasing the ecosystem orchestrator's economic power, a multi-actor ecosystem can be used to regularly extend the overall offer and to enter new sectors. Thus, digital ecosystems are often based on one or more underlying central platform(s) and a network of relationships between mutually complementary undertakings and/or services/products, such as apps in the Alphabet (Google) Play Store and the Apple App Store. Community and monetisation rules, developer standards, payment conditions and implementation systems are then defined by an orchestrator, that is to say, the entity that manages an ecosystem.

8. In principle, digital ecosystems can be identified by reference to a number of key criteria: Autonomous actors, modular architecture, non-generic complementarities in production and consumption, common value creation, data complementarities, centralised orchestration and governance. These will be discussed below.

9. Autonomous actors and modular architecture: Digital ecosystems generally consist of autonomous actors that provide mutually complementary contributions to an ecosystem's value creation.[7] The actors in an ecosystem operate in modules. They take up standardised roles in the modules, thereby contributing to value creation in a functionally interchangeable way. Modular architecture (modularity) means that a platform is linked with other components (such as actors, applications, services, platforms) via interfaces (such as application programming interfaces, APIs) and that this technical architecture generates synergies for further development and scaling, which in turn favour the development and expansion of an ecosystem, such as an operating system (Apple MacOS/iOS, Google ChromeOS) with a web browser (Apple Safari, Google Chrome) and integrated search engine (Google). Modularity influences the architecture by breaking up value chains with technical interfaces, enabling new undertakings to specialise and participate. Specialisation, on the other hand, has lock-in effects for providers of complementary services.[8] The operation of a digital ecosystem in conjunction with architectural control may thus be a very significant source of power.

Strategic Management Journal, 43(3), pp. 405–424; Baldwin, C.Y., 2024, Chapter 5: Ecosystems and complementarities, in: Design Rules (Volume 2): How technologies shape organizations, Ed. Baldwin, C.Y., MIT Press.

[7] Baldwin, C.Y./Bogers, M.L.A.M./Kapoor, R./West, J., 2024, "Focusing the ecosystem lens on innovation studies", Research Policy 53(1), 104949.

[8] Klein, B./Crawford, R.G./Alchian, A.A., 1978, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process", Journal of Law and Economics, 21(2), pp. 297-326. If specialised actors focus only on their

10. Non-generic complementarities and common value creation: An ecosystem architecture enables the creation of complex use experiences across products and services with great product variety. The various actors/services/products are typically interconnected by non-generic complementarities.[9] This interrelation (complementarity) is non-generic, that is non-standardised, when it requires specific investments in mutual adaptations and coordination as well as for the contribution to value creation. Complementarity is deemed to exist when the functions of different actors/services/products in production or use are mutually complementary. Thus, complementarities exist both in production and consumption. In production, the contributions of the different actors complement one another. In consumption, combined use and resulting synergies make the ecosystem's performance attractive for end users.[10] Non-generic complementarities require the creation of a specific relationship structure and focal value creation. The strength and special feature of digital ecosystems is that they offer an architecture within which complementarities of all kinds can be coordinated without the need for vertical integration. For this to happen, ecosystems require a certain degree of coordination, without the need for hierarchical management. That is the case because some standards or basic requirements can be used, enabling complementary actors to take their own decisions while at the same time enabling a complex service/product to be produced interdependently.[11] Ecosystem participation generally requires the use of APIs and ecosystem orchestrator protocols, which means that complementary actors are bound to this system to the extent that some of their investments only function within this ecosystem. The more specific these interfaces and protocols, the more an orchestrator can abuse its powerful position.[12] Thus, an ecosystem orchestrator can use APIs strategically by determining access modalities.[13] Complementarities thus enable the orchestrator to control a bottleneck, such as a central platform, while at the same time creating dependencies for providers of complementary services. Finally, complementarities generate a competitive advantage for the orchestrator through (exclusive) information on the complementary actors and also on end users which results from digital ecosystem operation. Complementarities

own individual components, they tend to underestimate the effects of their component level decisions on the system level – and thus do not internalise them – because they neglect multilateral Interdependencies.

9 Thomas, L.W.D./Ritala, P./Karhu, K./Heiskala, M., 2024, "Vertical and horizontal complementarities in platform ecosystems", Innovation: Organization & Management, https://doi.org/10.1080/14479338.2024.2303593.

10 Generally, complementarity relates to the relationship between two entities, whereby the value of one entity increases through its relation to the other. While a certain good or service is required to produce a complex value-added offering, this good or service may be generic, that is to say, standardised enough for the undertaking to be able to rely on it without having to worry about governance structures or the risk of misappropriation. The use of generic complementarities is an important and common method to facilitate production while at the same time hedging contractual risks.

11 Jacobides, M.G./Cennamo, C./Gawer A., 2018, "Towards a theory of ecosystems", Strategic Management Journal 39(8), pp. 2255-2276.

12 APIs may be specific, for example, stipulating the relevant functionalities, software code requirements and data formats and by using access restrictions.

13 Apple, for example, specified that the near-field communication (NFC) interface in iPhones can only be used by its own payment service Apple Pay, thereby excluding third-party payment services from using this interface. Within the framework of the Digital Markets Act (DMA), a conduct requirement places Apple under an obligation to open this interface to third-party payment services.

between the actors/services/products are valuable for the (further) development of (new) services/products and create incentives for leveraging economic power in other areas and thus for extending the ecosystem (so-called envelopment).[14] At the same time, this increases the barriers to third-party entry into these areas. An ecosystem's value creation results from the realised complementarities. The common value creation on both the production and the consumer side is so attractive for all digital ecosystem actors because it holds a disproportionately greater potential for innovation than if each actor operated on its own, for example the Apple App Store and the Google Play Store and app developers.

11. Data complementarities: In the context of ecosystems, data serve firstly as input, generating economies of scale in product developments. In addition, data complementarities may arise as a result of collecting, combining and recombining datasets in different ways and via different actors across the ecosystem. This can contribute to improving and extending the value-added offering and increasing the impact of data-driven network effects.[15] Finally, this opens up further opportunities for diversification and expansion on an ongoing basis.

12. Centralised orchestration and governance: As a general rule, a central ecosystem orchestrator[16] sets the standards of cooperation with complementary actors by creating the technical compatibilities and identifying the complementary combinations that provide added value. An orchestrator manages an ecosystem and decides on allocations of roles and conditions of participation. An orchestrator has a key position if it controls access to information, content, products, services, inputs and assets as well as functionality and positioning. In general, orchestrators are the owners of central platforms. A platform has key significance within a digital ecosystem when it has a large number of users in all user groups and stable intermediation power, and a relevant group of users can only be reached via this core platform service due to single-homing.[17] Economic complementarities and technical dependencies between the different actors operating within the ecosystem give a central orchestrator significant rule-setting power. Governance of the ecosystem can take place by using rules of conduct and interfaces as intermodular control points. This governance sets out who may compete within an ecosystem and under what conditions, and how conflicts are resolved. Thus, an incentive-compatible architecture must be created, promoting valuable contributions to the ecosystem and sanctioning damaging conduct. Thus, the governance mechanisms determine whether the orchestrator has the ability to enforce its interests. Often, these are platform-mediated ecosystems coordinated and controlled using one or a number of central platform(s).

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[14] Eisenmann, T./Parker, G./Van Alstyne, M., 2011, "Platform Envelopment", Strategic Management Journal 32(12), pp. 1270-1285.

[15] Prüfer, J./Schottmüller, C., 2021, "Competing with Big Data", Journal of Industrial Economics, 69(4), pp. 967-1008; Ritala, P./Karhu, K., 2023, "Capturing value from data complementarities: A multi-level framework", in Cennamo, C./Dagnino, G.B./Zhu, F. (Eds.), Research Handbook on Digital Strategy, pp. 273–288, Edward Elgar Publishing.

[16] In principle, the organisation of an ecosystem may be decentralised or centralised, collective or unilateral, bottom-up or top-down.

[17] Armstrong, M./Wright, J., 2007, "Two-sided Markets, Competitive Bottlenecks and Exclusive Contracts." Economic Theory 32(2), pp. 353-380.

13. The role of competition: Digital ecosystems are in competition with one another due to substitutability between multi-product ecosystems at end user level, horizontal competition between undertakings making rival offers within a multi-actor ecosystem and vertical competition relating to the added value resulting from cooperation between the complementary actors and the orchestrator. The actors compete for participation in individual transactions within the ecosystem and must prevail over other actors within a module by winning the favour of end users with their contributions. Thus, the undertakings have opposing interests in relation to dividing up the joint income or organising the ecosystem. Effective competition within the modules makes it more difficult for the ecosystem orchestrator to consolidate its powerful position. The interaction between the undertakings of an ecosystem is typically characterised by a combination of cooperation and competition (known as coopetition). Coopetition involves different aspects of the business relationship being divided between different activities. Typically, undertakings cooperate in sectors remote from end users, while competing in areas close to end users. Orchestrators can use their power over a core platform service to strengthen their position in an integrated module. For example, they can make it more difficult for other undertakings to compete in the module, while making it easier for their own services/products.[18] Competition between digital ecosystems is based on differentiating the core functionalities of core services/platforms/products and the customer experience, i.e. the different ways in which an ecosystem is orchestrated. In such cases, the orchestrator of a centralised ecosystem derives its competitive edge from the way in which actors/services/platforms/products interact and how the data generated and collected are combined, enabling it to tie users and providers of complementary services by means of lock-in effects. When there is effective competition between ecosystems, there is less likelihood that the ecosystem orchestrator will jeopardise competition within the modules.

3 Digital ecosystems and section 19a GWB

14. Modernisation of abuse control within the framework of the 10th Amendment to the German GWB is based mainly on the creation of a new power category: "undertakings of paramount significance for competition across markets". The aim of section 19a GWB is to identify possible anticompetitive effects and specific risk potential resulting from the reinforced possibilities for exploiting economic power. The intervention threshold for the new enabling provision – unlike the other abuse control provisions – is determined by consideration across markets. Thus, an overall assessment of all the relevant circumstances in the individual case should be undertaken (section 19a (1) GWB) to ultimately place the focus on abusive leveraging practices (section 19a (2) GWB). Section 19a GWB should be applied with the objective of protecting the competitive process with regard to not yet dominated markets and to prevent potentially irreversible effects on competition.[19]

[18] However, the orchestrator must design the ecosystem in the interest of the actors involved and allow them an appropriate share of the ecosystem's joint profits.

[19] Federal Government, Draft Act Amending the German Act against Restraints of Competition for a focused, proactive and digital competition law 4.0 and amending other competition law provisions (GWB Digitalisation Act),

15. On the one hand, the term "digital ecosystems" played a role in the legislative process on section 19a GWB.[20] On the other hand, there was a relatively clearly defined group of just a few potential norm addressees. Nor did the economics literature yet have the advanced knowledge that is now available. Moreover, section 19a GWB focused on the aspect of procedural acceleration and not the prerequisites for addressee status as digital ecosystems. This approach is favoured by the fact that the criteria of section 19a (1) sentence 2 GWB are largely similar to the general market power criteria of section 18 (3) to (3b) GWB. The creation of a new power category, which, among other things, results in a reversal of the burden of proof for the norm addressees, requires a sound basis of justification, also from an economic perspective.

16. The status in accordance with section 19a (1) GWB requires the Federal Cartel Office (Bundeskartellamt) to have already determined that the undertaking examined operates to a significant extent in markets within the meaning of section 18 (3a) GWB. This assumes the existence of business models based on platforms and/or networks in digital markets that have their focus there. For determining an undertaking's paramount significance for competition across markets in accordance with section 19a (1) GWB, the following unweighted catalogue of criteria applies, which is non-conclusive and need not be met cumulatively:[21] 1) its dominant position on one or several market(s), 2) its financial strength or its access to other resources, 3) its activities on several markets or in several areas and their integration, 4) its access to data relevant for competition, and 5) the relevance of its activities for third-party access to markets and its related influence on the business activities of third parties.

17. In previous proceedings under section 19a (1) GWB, the Bundeskartellamt always examined all five criteria and also determined that they had all been met.[22] From an economic perspective, however, the criteria specified in section 19a (1) GWB omit essential criteria that would enable digital ecosystems to be reliably identified. The aims of creating legal security and effectively and efficiently identifying cases where possible anticompetitive effects and special risk potential resulting from enhanced possibilities for abusing economic power need to be addressed. Thus, the legislator needs criteria that can be applied to establish an economically

19 October 2020, Federal Gazette 19/23492, p. 73, https://dserver.bundestag.de/btd/19/234/1923492.pdf (in German).

[20] Although the concept of "paramount significance for competition across markets" of section 19a GWB does not explicitly name digital ecosystems in the legislative text, it may be assumed that the intention was to identify in particular anticompetitive risks caused by ecosystems, see Bundestag document 19/23492, p. 73; see also Deutscher Bundestag – Wissenschaftliche Dienste, Sachstand: Die Anwendbarkeit von § 19a GWB im Lichte des europäischen Gesetzgebungsverfahrens zum „Digital Markets Act", WD 7- 3000- 114/21; PE 6- 3000 - 067/21, 07 January 2022; and Käseberg, T./Brenner, T./Fülling, D., 2021, "Das GWB-Digitalisierungsgesetz im Überblick", Wirtschaft & Wettbewerb, Heft 05, pp. 269-275.

[21] Federal Government, Draft Act Amending the German Act against Restraints of Competition for a focused, proactive and digital competition law 4.0 and amending other competition law provisions (GWB Digitalisation Act), 19 October 2020, Bundestag document 19/23492, p. 73, https://dserver.bundestag.de/btd/19/234/1923492.pdf (in German).

[22] Bundeskartellamt, B7-61/21 – Alphabet, decision of 30 December 2021; B6-27/21 – Meta, decision of 2 May 2022; B2-55/21 – Amazon, decision of 5 July 2022; B9-67/21 – Apple, decision of 3 April 2023.

sound definition of an ecosystem orchestrator. This would make the creation of this new category of power better justifiable and the associated elements simplifying the procedure.

18. Already the first criterion "dominant position on one or several market(s)" is to be seen critically since, in general, an economic analysis of competition is based on a substitutability approach, whereby a relevant market is defined on the basis of product substitutability from the demand perspective and flexibility of supply-side switching from the supply perspective. Digital ecosystems, understood to be "*a group of actors with a different degree of multilateral, non-generic complementarities that are not completely hierarchically controlled*",[23] make this approach insufficiently precisely targeted because these complementarities between undertakings operating in several markets create mutual dependencies that must be taken into account when analysing the dynamics of competition. In addition, active and potential competitors and cooperation partners may exist outside the relevant market. Thus, the focus of the economic analysis of competition should be on the complementarities between products/services/actors rather than on their substitutability. Viewing individual markets in isolation fails to recognise these links. An ecosystemic view of digital markets contributes to the ability to identify systemic power (i.e. ecosystem power) based on economic effects and mechanisms as well as legal, technical and economic possibilities of control of ecosystem participation and access.

19. The second criterion, "financial strength or access to other resources," too, is only suitable to a limited extent to show the orchestrator's economic power. Thus, there is no causal link between financial strength and market position or the effect on competition. The use of considerable funding does not necessarily lead to entrepreneurial success, but may also lead to bad investments. However, financial strength may contribute to holding out lengthy unprofitable phases, for example when establishing a (core) platform service and using foreclosure strategies to limit competition.

20. The third criterion, "activities of the undertaking on several markets or in several sectors and their integration", on the other hand, is more likely to be able to make the link to digital ecosystems. However, several markets may be integrated with one another in different ways, for example through a vertical or conglomerate relationship. Thus, an ecosystem-specific focus of analysis should be on the non-generic complementarities between the services/products/actors. These complementarities make the essential difference between platforms/networks and ecosystems and can thus comprehensibly contribute to explaining an undertaking's dominant position and its effect on competition.

21. The fourth criterion, "access to data relevant for competition" and the underlying concept of data power is only suitable to a limited extent. Data have economic characteristics, such as non-rivalry in use, which do not indicate per se that large quantities of data and the ability to use them to create value necessarily lead to an incontestable position.[24] However, exclusive

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[23] Jacobides, M.G./Cennamo, C. /Gawer, A., 2018, "Towards a theory of ecosystems", Strategic Management Journal 39(8), pp. 2255-2276.

[24] Cf. Chapter IV "Access to data from a competition policy perspective" in this Biennial Report.

data access in combination with data-driven network effects and complementarities in collecting, combining and recombining data may contribute to a strong market position.

22. Finally, the fifth criterion, "relevance of an undertaking's activities for third-party access to markets and its related influence on the business activities of third parties", is suitable for making a link to a digital ecosystem. It covers the rule-setting power of a central orchestrator or platform operator and the dependencies for third parties – but not necessarily due to non-generic complementarities between services/products/actors. However, these can cause considerable problems for competition in the context of an ecosystem.

23. Thus, an economic test concept to identify digital ecosystems is proposed below, which contains central characteristics of digital ecosystems and can thus contribute to an economically sound identification.

4 An economic test concept

24. In digital ecosystems, which typically have a modular architecture, actors/services/platforms/products are in a compatible and complementary relationship with one another. The actors are interconnected via the common use of certain standards (and possibly also datasets) and can provide added value across products, services, markets or sectors. As presented above, digital ecosystems can be identified using a number of key criteria: Autonomous actors, modular architecture, non-generic complementarities in production and consumption, common value creation, data complementarities, centralised orchestration and governance. In this context, an economic test should be conducted using the following three steps in order to be able to identify as precisely and comprehensively as possible digital ecosystems that have reached systemic economic power and, as a result, may be associated with particular risks to competition and the openness of digital markets.

25. First step – examine systemic factors: First, it must be examined whether there is a central orchestrator involving autonomous actors by means of a modular architecture using interfaces (APIs). Then, the existence of direct and indirect network effects, advantages of economies of scale and scope, singlehoming/multihoming by user groups and possible switching costs, both for suppliers and end users of complementary services, should be examined.[25] In addition, possible barriers to ecosystem access and expansion should be examined. If, for example, a platform service lacks relevant substitutes, the potential control over a bottleneck should be examined. The impact of data-driven effects on quality, such as feedback loops, are also relevant, particularly in data-driven markets. Finally, ecosystem-specific complementarities in consumption and production between the data/services/products of the orchestrator (multi-product ecosystem) and/or between the actors (multi-actor ecosystem) should be shown. This should take place in particular through an examination of the standards applied and basic require-

[25] These factors are covered by section 18 (3a) ARC. However, they relate there to a platform or network but not necessarily to an underlying ecosystem.

ments, which facilitate a certain level of coordination without requiring hierarchical management. These complementarities include community and monetisation rules, developer standards, access conditions and implementation systems.

26. Second step – determine ecosystem power: If the examination of the systemic factors suggests that a digital ecosystem exists, the economic power of the ecosystem orchestrator should be investigated. It should also be examined whether there is a central orchestrator that controls access to end users for competitors and suppliers of complementary services requiring such access in order to be able to compete in a significant area. An analysis must then be made as to whether this central orchestrator has significant scope of action vis-à-vis actors, business users and end users with regard to cooperation technologies and conditions of use. That is followed by the question as to whether this central orchestrator is protected by high barriers to access and/or expansion. Finally, an evaluation should be made of the advantages and possibilities for the orchestrator through complementarities in production, consumption and data. In an overall view, it becomes evident to what extent the orchestrator also has significant ecosystem power and how it can use this across different markets. Economic power within a digital ecosystem depends on the following: 1) the orchestrator's centrality, 2) the technological advantages, 3) the control points, for example, key components such as APIs, and 4) access to essential resources, such as data. The interplay of these factors can quickly increase the economic power of a central orchestrator and quickly scale up the ecosystem. The features of the ecosystem architecture allow conclusions to be drawn on where in the ecosystem market relations and competition arise, where they are particularly at risk and where competition is required in order for an ecosystem to be able to generate tangible advantages.

27. Third step – identify potential for discriminatory and leveraging practices: The orchestrator has stable economic power in an important area of the ecosystem – often a central platform which it makes available to end users – and is thus able to leverage its own core competencies in other areas and employ discriminatory practices. Leveraging strategies on the basis of non-generic complementarities are particularly incentive-compatible in the context of ecosystems, often occurring through restricting access and placing restraints on alternatives. In this way, for example, potential self-preferencing, bundling and tying practices, data access restrictions and default settings should be comprehensively examined and highlighted.

28. Overall, the proposed test consisting of three steps provide a framework for analysing digital ecosystems, thus enabling an economically sound identification of digital ecosystems. Potentially problematic ecosystems are the ones that have a central orchestrator. The proposed test concept enables anticompetitive effects and specific risk potential resulting from the reinforced possibilities for exploiting economic power to be identified.

5 Summary and recommendation

29. Digital ecosystems are characterised by the fact that actors/services/platforms/products are in a compatible and complementary relationship with one another. The actors are interconnected via the common use of certain standards and possibly also datasets and can provide added value across products, services, markets or sectors. Digital ecosystems are conceptually

different from regular digital platforms and networks and should therefore be identified using specific criteria. The Monopolies Commission is of the opinion that a clear concept makes it possible to focus on the real problems and should be used already within the framework of applying current law. In this context, the question arises as to the nature of a coherent economic concept and a corresponding test scheme to identify digital ecosystems. With this in mind, an economic test concept for identifying digital ecosystems using three test steps was proposed: 1) examine systemic factors; 2) determine ecosystem power; and 3) identify potential for discriminatory and leveraging practices.

30. Digital ecosystems pose particular risks to competition that go beyond the threats posed by simple digital platform services. Thus, in the view of the Monopolies Commission, section 19a GWB should be designed to explicitly address digital ecosystems. In order for the criteria of section 19a (1) GWB to be in a recognisable context that is aligned with the economic concept of digital ecosystems, the Monopolies Commission deems it necessary to show how these criteria relate to one another and how they jointly affect the creation and expansion of economic power (i.e. ecosystem power).

31. The legislator should draft section 19a (1) GWB to ensure that a comprehensive analysis of non-generic complementarities is conducted. These lead to rule-setting power for the orchestrator of a centralised ecosystem, create incentives for leveraging and discriminatory practices, create significant dependencies for third-party undertakings and, from an economic perspective, make the key difference between the phenomenon of a digital ecosystem and regular digital services, networks and platforms.

32. The Monopolies Commission therefore recommends that section 19a (1) GWB should be based on the analytic framework corresponding to current economic understanding; by taking an overall view,[26] the aim is to be able to appropriately identify and address digital ecosystems and the resulting specific risks to competition. The Monopolies Commission thus proposes that the catalogue of criteria in section 19a (1) sentence 2 GWB sould be redrafted accordingly:

"In determining the paramount significance of an undertaking for competition across markets, account shall be taken in particular of:

1. the non-generic complementarities between the digital ecosystem's actors, data, services, platforms and products,

2. the existence of autonomous actors jointly offering added value for consumers,

3. the existence of a modular architecture with a central ecosystem orchestrator."

[26] Viewing individual criteria in isolation fails to recognise that digital ecosystems acquire their specific competitive significance through the interplay of a number of factors.

The three proposed criteria would enshrine the ecosystem concept in section 19a (1) GWB,[27] contributing to specifying the status of norm addressees in more concrete terms while at the same time enabling a more precise economic analysis of digital ecosystems to be conducted.[28]

33. An economic basis of this kind also contributes to greater legal security. The Bundeskartellamt has already interpreted and applied the criteria of section 19a (1) sentence 2 GWB in four decisions. In addition, a ruling by the Federal Court of Justice has now specified in more concrete terms the application of the current version of the provision in established jurisdiction.[29] Nevertheless, from the Monopolies Commission`s view, the interest in a revision of the provision predominates; it would thereby become significantly clearer and more targeted. To this end, it should be consistently targeted specifically at digital ecosystems. With a view to the decisions already taken by the authority and their respective validity limited to five years from the date on which they become final (cf. section 19a (1) sentence 3 GWB), a provision on intertemporal law could be included, according to which the – newly drafted – provision only applies to future declaratory decisions.

[27] In consideration of the official practice and past rulings of the competition authority on section 19a (1) GWB, the Monopolies Commission also considers it conceivable for the catalogue of criteria existing in section 19a (1) sentence 2 GWB to be supplemented by the following criteria: "*In determining the paramount significance of an undertaking for competition across markets, account shall be taken in particular of: (...) 6. the non-generic complementarities between the digital ecosystem's actors, data, services, platforms and products, 7. the existence of autonomous actors jointly offering added value for consumers, 8. the existence of a modular architecture with a central ecosystem orchestrator.*" The ecosystem concept in section 19a (1) GWB would be emphasised by the inclusion of the three proposed criteria. In addition, it should be considered to what extent the first criterion "dominant position in one or several market(s)" should be dropped. On the one hand, this would result de facto in simplifying the proceedings, since a market definition and the identification of a dominant position – which are not required de jure – would no longer take place at great effort. As presented above, these only lead to the desired results to a limited extent in the context of ecosystems in any case. On the other hand, the determination of a dominant position and the market-based identification of the existence of a central platform within a digital ecosystem may lead to the desired results for reasons of "court validity" if this results in rule-setting power and significant dependence of third parties – albeit for other reasons.

[28] In particular because the criteria of section 19a (1) sentence 2 GWB are largely similar to the general market power criteria of section 18 (3) to (3b) GWB; on that subject, see note 15.

[29] Federal Court of Justice, KVB 56/22, 23 April 2024, Amazon (reasons for the judgment have not yet been published); cf. press statement no. 097/2024, 23 April 2024.