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TOWARDS A LEGAL THEORY OF DIGITAL ECOSYSTEMS

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Towards a Legal Theory of Digital Ecosystems

Ioannis Lianos, Klaas Hendrik Eller, Tobias Kleinschmitt[*]

Abstract

This article undertakes a legal conceptualization of digital ecosystems, analyzing their formation, functioning, and regulatory implications in a contextual manner. Our approach, informed through a comparative analysis of digital ecosystems across sectors and geographies, rejects the currently dominant narrative in regulatory debates in the digital economy, a 'natural order rhetoric', and adds nuance to its nascent critique, a 'power rhetoric'. The 'natural order rhetoric' assumes the superiority of private ordering over instituted processes such as regulation. This framing understands the private governance of ecosystems as 'given', rather than the product of a deliberate corporate strategy of keystone firms to gain rents, and hence argues for regulatory restraint. We expose the intellectual traditions behind this argument as unable to identify the essence of ecosystems as a novel mode of organization, and juxtapose an alternative framing: A 'power rhetoric' which is attuned to the manifestations of private power and means of control, both formal and informal, legal and technological, and that highlights the influence of central actors within these ecosystems which require regulatory intervention. We contend that the 'power rhetoric' has the right intuitions, but remains reductionist and inflexible in its perception of the role of private governance regimes that are necessary for digital ecosystems to function and produce social value.

We advocate for a third way, a broader framework premised on facilitating institutional change that may be socially satisfactory according to the circumstances and combines the capabilities of both public and private governance. Our conceptual inspiration comes from typologies of governance in (primarily industrial) Global Value Chains (GVCs) which we adjust to the context of digital ecosystems. Through a series of case-studies of existing ecosystems, we test the resulting typology and illustrate the role of concrete legal mechanisms, contractual terms, as well as soft and technological governance in creating and maintaining significant power imbalances in ecosystems, with keystone firms capturing disproportionate surplus value from collective innovation efforts and creating "externalities" at the societal level. We survey recent regulatory and antitrust law interventions in the EU, and UK, tantamount to a new era of digital regulation, and evaluate their engagement with systemic risks connected to the rise of certain ecosystems. We conclude that an approach of progressive institutional reform—cognizant of the political economy of technology regulation and grounded in an understanding of ecosystems as complex adaptive social systems is necessary to reflect a broader set of values in digital capitalism.

JEL Classification: K21, K23, L4, P48

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I. Introduction

Every form of economic organization presents legal analysis with the challenge of finding a suitable analytical framework to capture the empirical reality and attach appropriate normative implications to it. Past iterations of this challenge are tied to the rise of multinational corporations, production networks and global value chains, and, most recently, digital platforms. This paper turns to digital ecosystems, the latest institutional formation in the digital economy, to inquire how legal analysis should conceptualize ecosystems, what role law plays in the formation and functioning of ecosystems, and what are promising paths in exploring their governance. A wider legal analysis of ecosystems needs to understand ecosystems, their institutional setup and distributive implications as legally constituted—'legally' in a broad sense, including governance techniques that are at the intersection of law, social norms, and technology. This legal self-reflexivity in approaching ecosystems is what we refer to as a necessary 'legal theory' of ecosystems.[1]

[1] See similarly for the realm of finance (using 'legal theory' as a proxy for an institutionalist account) K. Pistor, A Legal Theory of Finance, (2013) 41 Journal of Comparative Economics 315; M. Roe, The Derivatives Market Payment Priorities as Financial Crisis Accelerator, (2011) 63 Stanford Law Review, and for the realm of money A. Chadwick, Rethinking the EU's 'monetary constitution': Legal theories of money, the Euro, and transnational law, (2022) 1 European Law Open 468.

Current discussions on digital ecosystems often adopt a 'natural order rhetoric', assuming the superiority of private ordering over instituted processes such as regulation.[2] This rhetoric builds on the intellectual tradition of an eclectic selection of economic theories, particularly Transaction Costs Economics (henceforth, 'TCE'), Resource-Based Views of the 'Firm' (henceforth 'RBV'), and Dynamic Capabilities Approaches. These theories always had decisive influence on the salient debates on regulating the digital economy. Recently, they have been repurposed to advocate for centralised private governance models in new organisational units like digital ecosystems.[3] In this line of argument, private governance solutions are defended as preferable to regulation on a wide range of regulatory aspects, including data protection, competition, and content moderation.

The 'natural order rhetoric' is however increasingly being challenged. Critics argue that it ignores the genealogy and the varied ontology of the structuring power of central private digital actors[4] in their economic and socio-political environment.[5] They call for attention to the links between the private organisation of the digital economy, the strategic incentives of individual actors, and the way these are shaped by the institutional context. This 'power rhetoric' foregrounds the role of regulatory frameworks within which private governance can unfold and advocates for a shift towards more public governance in the digital industry.[6] More specifically, an analysis based on 'power' is a productive vantage point to trace new manifestations of private power in the digital economy. New ecosystem business models draw on new means of exerting control through a network, in both formal and informal manners, to ultimately change the architecture and boundaries of entire industries.

Such a 'power rhetoric', however, has remained at the fringes of regulatory debates on the digital economy and in particular does not yet sufficiently reflect the empirical reality of private governance structures. This has perpetuated the digital/industrial divide that currently persists in debates on the regulation of private power.[7] While in the context of industrial value chains, different modes of private power have been scrutinized and typologized for long to

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[2] For a general introduction to the 'natural order rhetoric' see C.M.A. Clark, Spontaneous Order versus Instituted Process: The Market as Cause and Effect, (1993) 27(2) Journal of Economic Issues 373; for a poignant critique see B. Harcourt, *The Illusion of Free Markets – Punishment and the Need of Natural Order* (Harvard University Press, 2012), who criticises "the 'illusion' of 'free markets' perceived as a natural order that pre-exists regulation". By 'rhetoric', we mean for our context a certain way of framing and arguing about matters of digital policy that draws – often rather tacitly than explicitly – on the purported superiority of certain types of governance, operating as underlying narrative rather than as distinct academic argument.

[3] See, for instance, N.J. Foss, J. Schmidt, D.J. Teece, Ecosystem leadership as a dynamic capability, (2023) 56(1) Long Range Planning 102270.

[4] Various metaphors such as *gatekeeper*, *orchestrator*, *intermediary, bottleneck, lead firm, keystone organisation or ecosystem captain* have been employed to describe these actors, often presenting a slightly nuanced understanding of their characterisctics.

[5] I. Lianos, B. Carballa-Smichowski, A Coat of Many Colours – New Concepts and Metrics of Economic Power in Competition Law and Economics, *Journal of Competition Law & Economics*, 2022; nhac002, https://doi.org/10.1093/joclec/nhac002.

[6] Many jurisdictions have introduced specific legal tools angled at controlling private economic but also political power. For a detailed description of these tools see Section V. of this article.

[7] See J. Salminen, M. Viljanen, K. Sobel-Read & K.H. Eller, Digital platforms as second-order lead firms: Beyond the industrial/digital divide in regulating value chains, European Review of Private Law, European Review of Private Law 2022, 1059; F. Butollo, G. Gereffi, Ch. Yang, M. Krzywdzinski, Digital transformation and value chains: Introduction, Global Networks 22 (2022), 585.

shape regulatory debates[8], the same is not true for digital policy. We argue that taking a Global Value Chain (henceforth, 'GVC') perspective to map the modes, functions, and limits of private governance may provide the missing link to close these gaps. In particular, scholarship on GVCs has engaged at length with different organisational formations of production and the underlying arrangements of private governance—a perspective that can be mobilised to come to terms with new business models and organisational setups in the digital economy.

However, the power rhetoric may also be reductionist to the extent that it may not account for the specificities of the "ecosystemic mindset"[9] and possible efficiencies of orchestration in the collective effort to co-produce value through a combination of private and public governance mechanisms. If there is a choice to be made between the tools of public or private governance of ecosystems, one should integrate the fact that both are expressions of a complex adaptive social system[10], in which (legal) institutions matter[11]. Any institutional choice should, however, be the result of a comparative institutional analysis that takes into account the public values of each polity and integrates evolutionary expectations framed by the unescapable, in an adaptive system, process of institutional change.

In the *first Section*, we trace the 'organisational' turn of the literature on digital economic policy. We explore how the concept of ecosystem has evolved from a meso-concept in economics into a legal concept informing the debate on private and public governance in the digital economy. We explain the characteristics of ecosystems and how they differ from other organisational models like firms, supply chains, and markets.

The *second Section* discusses the theoretical underpinnings of the 'natural order rhetoric', in particular its expression in TCE and RBV and Dynamic Capabilities Approaches. We highlight the private governance bias inherent in this perspective, driven by the will to adopt forebearance as the driving regulatory response to challenges posed by the emergence of digital ecosystems.

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[8] J. Salminen, M. Rajavuori & K.H. Eller, Global Value Chains as Regulatory Proxy: Transnationalizing the Internal Market through EU Law, in A. Beckers et al (eds), European Transnational Law (Oxford: Hart Publishing, 2024), 367-398.

[9] S. Ben Letaifa, The uneasy transition from supply chains to ecosystems: The value-creation/value-capture dilemma, (2014) 52(2) Management Decision 278.

[10] As observed by I. Lianos, Minding Competition Law in Complex Adaptive Social Systems (CLES Research paper 1/2024), "The integration of Complex Adaptive System (CAS) provides powerful insights and an evolutionary approach that could be of great value for analyzing digital ecosystems to the extent these rely on transformational technological innovations. Such approaches tend to overemphasize the autopoietic nature of the economy or the role of technology in the emergence of the economy and do not engage with the way institutions (formal or informal), including the legal system, may influence the process of social change. Hence, it becomes important to adjust the natural and techno-determinist bias in Complex Adaptive Systems thinking by integrating more institutions (both formal and informal, market and nonmarket, technology-based or culture-based) in the way we think about the economy and explore a broader approach that engages with complex adaptive *social* systems (hereinafter CASS). On complex adaptive systems, see, among others, among others, P. Anderson, K.J. Arrow, D. Pines, *The Economy as an Evolving Complex System* (Addison-Wesley, Reading, MA, 1988); W.B. Arthur, S.N. Durlauf, D.A. Lane (eds.), *The Economy as an Evolving Complex System II* (Addison-Wesley, Reading, MA, 1997); L. Tesfatsion, Agent-based computational economics: modelling economies as complex adaptive systems, (2003) 149(4) Information Sciences 262. For a more detailed discussion of ecosystems as complex social adaptive systems see Section VI of this article.

[11] See, S. Deakin, D. Gindis, G.M. Hodgson, K. Huang & K. Pistor, Legal Institutionalism: Capitalism and the Constitutive Role of Law, Cambridge Legal Studies Research Paper Series N0. 26/2015 (April 2015); K. Pistor, A Legal Theory of Finance, (2013) 41 Journal of Comparative Economics 315; K. Pistor, *The Code of Capital: How the Law creates Wealth and Inequality* (Princeton Univ. Press, 2019.

The *third Section* provides analytical and operational content to the 'power rhetoric' which we contrast with the 'natural order rhetoric'. We attempt to illustrate how this alternative approach provides a more fine-grained description of the power that Big Tech platforms wield over the members of digital ecosystems.

The *fourth Section* attempts to identify and fill gaps in the empirical foundations of the 'power rhetoric', by the same showing how it runs at the same risk of reductionist thinking as the natural order perspective. We analyse the organisational relations between the various ecosystem members and highlight the regulatory and centralising role of powerful private actors. Through a series of case-studies of existing ecosystems, we test the resulting typology and illustrate the role of concrete legal mechanisms, contractual terms, as well as soft and technological governance in bringing about significant power imbalances in ecosystems, with keystone firms capturing disproportionate surplus value from collective innovation efforts and creating "externalities" at the societal level[12].

In the *fifth Section*, we return to the emerging role of public governance (or regulation). Building on the previous section, we analyse how public governance responses reflect the strengths and shortcomings of the opposing rhetorics. We shed light on the alleged failure of the traditional regimes of contract and competition law in dealing with the multi-dimensional reality of power and externalities in the digital economy. Furthermore, we engage in a comparative institutional analysis of new regulatory tools, whose emergence indicates an expansion of public governance and a limitation of private governance in (digital) ecosystems. We examine these regulatory innovations and advocate for an approach that acknowledges that ecosystems form part of complex adaptive social systems, which should be regulated by incorporating broader public values and a theoretical understanding of institutional change.

II. From Metaphor to Theory: The Current State of Ecosystem Research

The search for appropriate organisational categories for the digital economy has long been a focus of the regulatory debate. Ecosystem theory has emerged over the last few years as a leading analytical framework informing the study of private governance in the digital industry. It lends itself as an inroad to the debate, even though the concept has been plagued with varieties of meaning. The term 'ecosystem' was first introduced into the governance discourse as a rather inconsistently used metaphor without a coherent theoretical foundation, or concrete legal implications.[13] The first conceptualisations of ecosystems were put forward by business

[12] Although the concept of "externalities" is mostly used to denote the social costs of the market form of organization (in particular for those actors not part of the market exchange), we are using this here in the same way to denote the social costs of ecosystems (perceived as an organizationalform of coordinating interactions between a number of actors co-producing value along an aligned vision for a focal value proposition). See, for a discussion of externalities M.G. Jacobides, C. Cennamo, A. Gawer, Externalities and complementarities in platforms and ecossytems: From structural solutions to endogenous failures, (2024) (53) Research Policy 104906, 1. On the need to engage with markets and other economic organizations, see H.A. Simon, *The Sciences of the Artificial* (MIT press, 2019, 3d ed. 1996), 31 who observes that "(r)oughly eighty percent of the human economic activity in the America economy, usually regarded as almost the epitome of a "market" economy, takes place in the internal environments of business and other organizations and not in the external, between-organization environments of markets".

[13]The business studies literature on ecosystems has initially focused on the boundaries of the concept and the types of economic interaction that could be covered by it. The definitional ambiguity resulted from the descriptive rather

management literature[14]; rarely however with both broad empirical and nuanced normative grounding. While analytical frameworks unavoidably carry normative implications when introduced in legal debates, we attempt to use an ecosystem analytic that is normatively open and captures the emergence and structure of governance in an empirically pertinent fashion. We therefore take a rather broad perspective and define an ecosystem as *a community of multiple independent actors, which exhibit unique or supermodular, non-generic complementarities, forming a modular architecture and requiring an alignment structure to maximise their joint value.*[15] The following section will briefly explain the central pillars of this definition.[16]

A. The Building Blocks of Ecosystems: Complementarity and Modularisation

The first feature of digital ecosystems is that they are comprised of multiple independent actors (the ecosystem members). This requirement does not refer to corporate organisation, but rather decisional independence: Ecosystems only emerge when there are several ecosystem members (*multiple*) who retain a certain degree of control over their actions and assets (*actors)*. Ecosystems are not fully hierarchical and therefore distinct from the organisational model of an integrated 'firm'.[17]

The second feature of ecosystems is a specific type of complementarity between the individual contributions of the ecosystem members. General complementarity, in the sense that the use or value of one product (product A) increases the use or value of another product

than normative approach followed by Moore who provided different definitions of what constitutes an ecosystem in his work: J.F. Moore, Predators and Prey: A New Ecology of Competition, (1993) 71(3) Harvard Business Review 75. Indeed, while in his 1996 work he mentions that "a business ecosystem is made up of customers, market intermediaries […] suppliers, and of course, oneself," he continues "(t)hese might be thought of as the primary species of the ecosystem […] (b)ut a business ecosystem also includes the owners and other stakeholders of these primary species, as well as powerful species who may be relevant in a given situation, including government agencies and regulators, and associations, and standards bodies representing customers or suppliers" [F. Moore, *The Death of Competition: Leadership and Strategy in the Age of Business Ecosystems* (HarperCollins, 1996), 26], in his more recent work, however, he seems to focus on the ecosystem leaders and their complementors [J.F. Moore, Business ecosystems and the view from the firm, (2006) 51(1) The Antitrust Bulletin 31, 34]. See also, on the concept of business ecossytem.M. Iansiti & R. Levien, *The Keystone Advantage - What the New Dynamics of Business Ecosystems Mean for Strategy, Innovation, and Sustainability* (Harvard Business School press, 2004); D. Teece, "Next-Generation Competition: New Concepts for Understanding How Innovation Shapes Competition and Policy in the Digital Economy," (2012) 9 *Journal of Law & Policy*, 97, 105-6..

[14] The standard reference here is Michael G Jacobides, Carmelo Cennamo and Annabelle Gawer, 'Towards a Theory of Ecosystems' (2018) 39 Strat Manag J 2255, 2266 et seqq., Teece, 2012: 105-6 defines ecosystems as "a group of interacting firms that depend on each other's activities […] reliant on the technological leadership of one or two firms that provide a platform around which other system members, providing inputs and complementary goods, align their investments and strategies". While this definition may be an accurate describtion of most ecosystems, it does carry a normative connotation.

[15] Similar definitions have been put forward by Michael G Jacobides, Carmelo Cennamo and Annabelle Gawer, 'Towards a Theory of Ecosystems' (2018) 39 Strat Manag J 2255, 2266 et seqq.; Jacobides/Lianos: Ecosystems and Competition Law in Theory and Practice; Philipp Hornung, The Ecosystem Concept, the DMA, and Section 19a GWB, Journal of Antitrust Enforcement, 2023;, jnad049, https://doi.org/10.1093/jaenfo/jnad049; the requirement of an alignment structure was first put forward by Adner, 2017: 42

[16] For an excellent elaboration on the constituting elements of ecoystems, which is beyond the scope of this article, see P. Hornung in Journal of Antitrust Enforcement 2023, available here: https://academic.oup.com/antitrust/advance-article/doi/10.1093/jaenfo/jnad049/7452873?login=false

[17] Michael G Jacobides, Carmelo Cennamo and Annabelle Gawer, 'Towards a Theory of Ecosystems' (2018) 39 Strat Manag J 2255, 2264.

(product B), is not sufficient for the emergence of ecosystems. [18] The complementarity in ecosystems must be unique or supermodular and non-generic. Unique means that product A is unable to function without product B. Supermodular means that within a group of products, "doing more of any subset of them [e.g. product A] increases the returns to doing more of any subset of the remaining activities [product B, C, etc.]".[19] In both cases, the complementarity must be non-generic. Where goods or services are sufficiently generic, there is no need for a particular organisational structure to maximise complementarity.[20] We would likely observe the emergence of conventional market structures instead.[21] This is one of the reasons why ecosystems are more prevalent in markets for complex technical products than in traditional industrial sectors.

The third central characteristic of ecosystems is the modularity of the individual contributions from ecosystem members. At first glance, this element of modularity may seem to contradict that the products are generally non-generic or non-standardised. Modularity in ecosystem theory, however, does not mean open 'plug and play' interoperability.[22] Such interoperability would void the requirement for a specialised governance structure and likely lead to the emergence of markets.[23] It rather denotes the organisational separability 'along a production (or production and consumption) chain', leading to a grouping of individual contributions with similar function in modules.[24] This does require interoperability between modules—a feature described as 'thin crossing points'[25]—but it will be subject to complex unilateral or multi-lateral rules and closed or controlled access.

B. The Ecosystem Glue: Interdependence and Private Governance

[18] Product here should be understood in a broad sense to include also services.
[19] This is the definition by Milgrom and Robert, which developed the concept of supermodular complements, see Milgrom, P., & Roberts, J. (1990). Rationalizability and learning in games with strategic complementarities. Econometrica, 58(6), 1255–1278. Supermodularity was first introduced into the ecosystem concept by Michael G Jacobides, Carmelo Cennamo and Annabelle Gawer, 'Towards a Theory of Ecosystems' (2018) 39 Strat Manag J 2255, 2262.
[20] Ron Adner, 'Ecosystem as Structure: An Actionable Construct for Strategy' (2017), Journal of Management 43 No. 1, 39–58; Michael G Jacobides, Carmelo Cennamo and Annabelle Gawer, 'Towards a Theory of Ecosystems' (2018) 39 Strat Manag J 2255, 2262; Oliver Williamson, 'Transaction-Cost Economics: The Governance of Contractual Relations', 22 *Journal of Law & Economics* 233-261 (1979)
[21] Ron Adner, 'Ecosystem as Structure: An Actionable Construct for Strategy' (2017), Journal of Management 43 No. 1, 39–58; Michael G Jacobides, Carmelo Cennamo and Annabelle Gawer, 'Towards a Theory of Ecosystems' (2018) 39 Strat Manag J 2255, 2262; Oliver Williamson, 'Transaction-Cost Economics: The Governance of Contractual Relations', 22 *Journal of Law & Economics* 233-261 (1979)
[22] Michael G Jacobides, Carmelo Cennamo and Annabelle Gawer, 'Towards a Theory of Ecosystems' (2018) 39 Strat Manag J 2255, 2260, footnote 7.
[23] Baldwin, C. Y. (2008), Where do transactions come from? Modularity, transactions, and the boundaries of firms. Industrial and Corporate Change, 17(1), 155–195; Langlois, R. N. (2003). The vanishing hand: The changing dynamics of industrial capitalism. Industrial and Corporate Change, 12(2), 351–385; Jacobides, M. G., & Winter, S. (2005). The co-evolution of capabilities and transaction costs: Explaining the institutional structure of production. Strategic Management Journal, 26, 395–413.
[24] Michael G Jacobides, Carmelo Cennamo and Annabelle Gawer, 'Towards a Theory of Ecosystems' (2018) 39 Strat Manag J 2255, 2260, footnote 7.
[25] C. Baldwin, "Ecosystems and Complementarity" Harvard Business School Working Paper (August 2020).

The organisational novelty of ecosystems is however based on a fourth key feature, namely the way ecosystems create value and the necessity of an alignment structure to maximise the ecosystem value creation.

1. The Ambivalent Relationships between Ecosystems Members

The joint value creation creates strong interdependencies between the ecosystem members. As is common for networked structures[26], there is a high degree of reliance and abstract reciprocity when it comes to maximising the ecosystem's value and eventually maintaining a competitive offering regarding other ecosystems.[27] The relations between them are, however, not solely cooperative. Since ecosystem members are independent actors, they commonly have incentives to maximise their respective value capture, which leads to competition between actors within the same module or in nascent modules. The resulting ambivalence of the relationship between ecosystem members has led to the description of the ecosystem as a system of co-petition.[28]

2. Indispensability and Value of Private Governance

'Competitive interdependence' between several players is not a novel phenomenon in economic relations.[29] What sets the interdependence in ecosystems apart from other types of organisational labour division (such as supply chains) is the fact that the value of the ecosystem (ie the complements and the core functions) is greater than the sum of the values of the different parts.[30] From that perspective, the concept of ecosystem challenges the dominant view in neoclassical economic thinking according to which transactions are the fundamental units of economic analysis.[31] Ecosystems exhibit the emergence of a superadditive and distinct value of the whole (the 'ecosystem glue'), based on the contributions of each member of the ecosystem (which participate in the web of transactions).[32] This "joint value proposition by several players cannot be achieved by any one of the individual players in isolation".[33]

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[26] D. Grewal, Network Power: The Social Dynamics of Globalization (Yale University Press, 2008), 17-43; G. Teubner, Networks as Connected Contracts (Hart Publishing 2011).

[27] For a general introduction to the concept of networks and reciprocity see Walter W. Powell, 'Neither Market nor Hierarchy – Network Forms of Organization', 12 Research in Organizational Behaviour 295-336 (1990).

[28] Nicholas Petit and David J Teece, 'Taking Ecosystems Competition Seriously in the Digital Economy: A (Preliminary) Dynamic Competition/Capabilities Perspective' (2020) OECD, DAF/COMP/WD(2020)90, para 17.

[29] See from a TCE perspective Oliver Williamson, 'Transaction-Cost Economics: The Governance of Contractual Relations', 22 *Journal of Law & Economics* 233-261 (1979); but also the critiques by Mark Granovetter, 'Economic Action and Social Structure: The Problem of Embeddedness', 91 American Journal of Sociology, 481-510 (1985) and Walter W. Powell, 'Neither Market nor Hierarchy – Network Forms of Organization', 12 Research in Organizational Behaviour 295-336 (1990)

[30] C. Baldwin, "Ecosystems and Complementarity" Harvard Business School Working Paper (August 2020), 1.

[31] This has already been discussed with regards to networks, see Walter W. Powell, 'Neither Market nor Hierarchy – Network Forms of Organization', 12 Research in Organizational Behaviour 295-336 (1990)

[32] For a detailed explaination why an integreated firm or a market-based organisation would struggle to generate the same value, see P. Hornung in Journal of Antitrust Enforcement 2023, available here: https://academic.oup.com/antitrust/advance-article/doi/10.1093/jaenfo/jnad049/7452873?login=false

[33] B. Lingens, L. Miehe, O. Gassman, The ecosystem blueprint: How firms shape the design of an ecosystem according to the surrounding conditions, Long Range Planning 54 (2021) 102043.

The modular structure of the ecosystem does, as established above, require organising principles and rules to enable the technical interoperability between the various modules in order for complementarities to emerge. However, complementarities may not only result from the underlying technical system,[34] but are crucially dependent on the existence of ecosystem rules and governance of cooperation and 'membership'.[35]

It may precisely be "*because of these rules*, [that] it tends to be more attractive to purchase [product] A1 and B1 than to combine any of these with a version of the other which is not subject to these rules" (product A2 and B2). [36] Hence, "an eco-system requires a mix of ownership and common rules which makes it more likely that consumers would purchase several items from different suppliers".[37] Summarising the state of understanding in this extensive literature, Baldwin et al. refer to ecosystems as "a network of autonomous economic actors interacting to create value, including a complementary surplus, which is distributed across actors"[38]. The focus is therefore not only on the complementarity of the usage systems, but also on the structure of the (technical, organizational and other) dependencies that arise between the various members of an ecosystem.[39]

Without such rules, ecosystems can experience 'value network' failures that may stem either from the lack of coordination between the independent firms interacting in the ecosystem, or 'systemic innovation' failures arising out of difficulties in developping components or complements that support the innovation system in question. These failures may affect the capability of the ecosystem to attain its full surplus value potential and may either relate to functional or distribution disagreements between its members.[40]

3. Mechanisms of Private Governance

Ecosystems therefore require an "alignment structure of the multi-lateral set of partners that need to interact in order for a focal value proposition to materialise".[41] Importantly, as we will see further below (4.), the degree of influence of different ecosystem members to shape the governance structures is highly uneven.

The ecosystem concept takes a meso-level perspective on governance structures.[42] These are understood as a product of directly interdependent economic agents (most often in oligopoly structures) striving to adapt through governance regimes (institutions) to the situation of strategic uncertainty generated by the great complexity of the linkages and relations between

[34] See for instance the definition of ecosystems by C.Y. Baldwin, Organization design for business ecosystems. (2012) 1(1) *Journal of Organization Design*, 20-23. "Ecosystems…encompass numerous corporations, individuals, and communities that might be individually autonomous but [are] related through their connection with an underlying evolving technical system".
[35] M.G. Jacobides, C. Cennamo, A. Gawer, Externalities and complementarities in platforms and ecossytems: From structural solutions to endogenous failures, (2024) (53) Research Policy 104906, 1.
[36] P. Regibeau, Current Challenges in Competition Policy (October 2022), part 3.5.
[37] Ibid.
[38] C.Y. Baldwin, M.L.A.M. Bogers, R. Kapoor, J. West, Focusing the ecosystem lens on innovation studies, (2024) (53) Research Policy 104949, 1.
[39] Ibid., 3.
[40] M.G. Jacobides, C. Cenammo, A. Gawer, Externalities and complementarities in platforms and ecosystems: From structural solutions to endogenous failures, (2024) Research Policy 104906, 1.
[41] Adner, 2017: 42.
[42] K. Dopfer, J. Foster & J. Potts, Micro-meso-macro, (2004) 14 Journal of Evolutionary Economics 263.

them (complex adaptive systems).[43] Thus, members of ecosystems, although independent firms, are not solely relying on on the price system to coordinate economic activities (as independent firms do in a de-centralised market), but use prices "in conjunction with bilateral contracts, multi-lateral negotiations and [technical] platforms".[44] The dispersed knowledge system and the dominance of a logic of individual profit maximisation are thus replaced by a coordinated knowledge system and a focus on ecosystemic or community profit maximisation. This has led some authors to argue that "(e)cosystems represent a different approach to the problem of coordinating complementary resources […] As a form of organisation, ecosystems are at an advantage in the "middle ground" where complementarities require consistent action and decision-making, but there are also benefits to autonomous search and independent experimentation".[45]

4. Predominance of 'Centralised Platform Orchestration'

'Central platform orchestration' is the predominant governance model in digital ecosystems. This means that usually one actor in the ecosystem guides the multi-product and/or multi-actor effort. This actor has decisive or even unilateral influence on the governance structure of the ecosystem, including the rules and conditions of membership (who is participating), the activities (who does what) and the value architectures and distribution (who gets what).

Orchestrators often own central platforms that may be conceived as techo-economic 'agencements' that structure different dimensions of economic exchanges.[46] In this conception, platforms are the technical (transactional or even social[47]) infrastructures that enable autonomous entities to connect and transact, thus developing between them some form of technological or transactional dependency. Platforms exercise an intermediation function, while ecosystems are a broader concept encompassing all indirect interdependencies and the subsequent 'relational architecture' that emerges from the collaborative effort of autonomous actors (organisations and individuals).[48]

[43] See Footnote 9.
[44] C. Y. Baldwin, "Ecosystems and Complementarity" Harvard Business School Working Paper (August 2020), 33.
[45] C. Y. Baldwin, "Ecosystems and Complementarity" Harvard Business School Working Paper (August 2020), 33.
[46] On the concept of "market agencement", see *inter alia* F. Muniesa, Y. Millo & M. Callon, An introduction to market devices, (2007) *The Sociological Review*, *55*(2_suppl), 1–12. These "market agencements" do not only rely on "market devices" but also result from the contribution of the legal regime and the way it codes economic structures and activities, see M. Callon, Markets in the Making – Rethinking Competition, Goods and Innovation (Zone Books, 2021), 48 and P. Terzis, Law and the political economy of AI production, International Journal of Law and Information Technology 31 (2023), 302-330.
[47] P. Aspers & A.Darr, The social infrastructue of online marketplaces: Trade, work and the interplay of decided and emergent orders, (2022) 73(4) British Journal of Sociology 822.
[48] C.Y. Baldwin, et al. (2024), 3 (noting the existence of three criteria to identify ecosystems: autonomy, complementarity, modularity).

However, not all orchestrators own platforms[49] and not all of them become dominant actors in their ecosystems; there exists a (theoretical) possibility of decentralised ecosystems—consider for instance nonhierarchical governance in blockchain ecosystems where technology provides the governance blueprints.[50] The orchestration may also be directed instead of deliberative.[51] It should therefore be noted that 'central platform orchestration', while currently prevalent, is only one among different possible governance modes in digital ecosystems. It is not the exclusive way for private governance structures to emerge.

III. Narratives on Private Governance in Ecosystems

As established in the previous section, ecosystems exhibit a strong need for private governance structures to operate in the first place and to do so efficiently. The way these governance structures are established, maintained and changed, however, remains an underexplored area. Existing conceptualisations of ecosystems do not currently offer a full-fledged organisational typology with clear parameters of the modes and loci of power. In particular, such conceptualisations do not conclusively explain whether the prevalence of 'central platform orchestration' can be rationalized as the most efficient and therefore value maximizing ecosystem order (governance as natural order), whether it is merely the preferred and established mode of governance of powerful ecosystem actors to enhance their value capture (governance as power) or whether there are other explanations for the emergence of this specific organizational structure.

The literature on ecosystems is divided into two broad streams that provide different answers to these questions. In this section, we will analyse the two streams which we have labeled the 'natural order rhetoric' and the 'power rhetoric'.

A. The 'Natural Order Rhetoric'

The dominance of the model of centralised ecosystems managed by digital platforms or orchestrators has led to the emergence of a 'natural order rhetoric'. Pervasive in regulatory and academic debates as well as public narratives[52], this rhetoric advocates for a welcoming perspective towards private governance tools and a limited public or regulatory intervention. This section will expose the intellectual foundations of the 'natural order rhetoric' in economic thought. We argue that a schematic reliance on those roots in legal debates is deeply problematic as it overemphasises and essentialises the 'natural' drive towards certain

[49] C.Y. Baldwin, et al. (2024), 3 raise the possibility of non-platform ecosystems in which other means of coordination than technical platforms may be used, such as „bilateral transactions and contracts, multi-lateral agreements arranged by orchestrators and temporary linkages arranged by system integrators".

[50] I. Lianos, https://discovery.ucl.ac.uk/id/eprint/10058462/, In: Hacker, P and Lianos, I and Dimitropoulos, G and Eich, S, (eds.) *Regulating Blockchain: Techno-Social and Legal Challenges*, (Oxford University Press, 2019), Chapter 18; M.G. Jacobides, C. Cennamo, A. Gawer, Externalities and complementarities in platforms and ecossytems: From structural solutions to endogenous failures, (2024) (53) Research Policy 104906, 9 (noting that "research is only just beginning to look at decentralised ecosystems").

[51] M. Jacobides & I. Lianos, Ecosystems and competition law in theory and practice, (2021) 30(5) *Industrial and Corporate Change*, 1199, Table 1.

[52] See on the intellectual foundations of free market thinking L. Herzog, Citizen Knowledge (Oxford: Oxford University Press, 2024), 87-103.

governance patterns, and hereby establishes a bias in favour of solutions of private governance as the preferred instrument to deal with 'value network' and 'systemic innovation' problems resulting from cooperation or alignment failures.

We see the intellectual lineage of the 'natural order rhetoric' to stem essentially from Transaction Cost Economics as well as Resource-Based Views of the Firm – two theoretical traditions that are highly influential in corporate, competition and economic law at large[53], as well as theories on dynamic capabilities. In short, our argument is that we witness a return of the older controversy on markets' self-steering ability that would make law, allegedly, an external and non-essential element to the functioning of markets, or in this case ecosystems This debate and the different imaginaries of markets have had direct ramifications in legal thought.[54]

1. Transaction Cost Economics and the Law of Forbearance

The general premise of TCE proponents regarding regulatory intervention is that the legal regime should only get involved where such intervention would lower transaction costs compared to a more integrated form of control and coordination between the parties to the transaction.[55] This generally means that the law should stay agnostic to internal disputes within an organisational hierarchy.[56] There are two main reasons that are invoked to justify this 'law of forbearance'.[57] The first is that parties to an internal dispute have deep knowledge about both the circumstances surrounding a dispute as well as the efficiency properties of alternative solutions, which could only be communicated to the court at great cost. The second is that permitting the internal disputes to be appealed to the court would undermine the efficacy and integrity of a hierarchy.

The TCE literature has, however, long acknowledged that the variety of organisational structures transcends a simple binary order of 'markets' and 'hierarchies'.[58] Instead, they are

[53] See e.g. on the legacy of Transaction Cost Economics in modern contractual debates J. Salminen, Towards a Genealogy and Typology of Governance Through Contract Beyond Privity, European Review of Contract Law 16 (2020), 25-43.

[54] A. Lang, Market anti-naturalisms, in J. Desautels-Stein & T. Christopher (eds), Searching for Contemporary Legal Thought (Cambridge University Press, Cambridge, 2017), 312-329.

[55] This idea has been introduced by Ronald H. Coase, 'The Nature of the Firm', Economica 1937, 386-405

[56] O. Williamson, "The Economics of Governance", (2005) 95 *American Economic Review*, 10: "whereas courts routinely grant standing to contracts between firms should there be disputes over prices, the damages to be ascribed to delays, failures of quality, and the like, the courts have the good sense to refuse to hear disputes between one internal division and another over identical technical issues. Access to the courts being denied, the parties must resolve their differences internally, which is to say that the firm becomes its own court of ultimate appeal"

[57] Williamson, (1), 100.

[58] Oliver Williamson, 'Transaction-Cost Economics: The Governance of Contractual Relations', 22 Journal of Law & Economics 233-261 (1979)

often situated on a spectrum between these two poles.[59] In such hybrid[60] organisations, each participant maintains its autonomy, distinguishing it from hierarchical structures. Simultaneously, hybrids are not purely market-based, as they incorporate either formal or informal mechanisms designed to facilitate long-term coordination and cooperation among the members of the organisation. Hybrids cover a variety of organisational forms, such as alliances, collective trademarks, networks, partnerships and relational contracts.[61]

The complexity of such economic relations, which involve significant and specifically-tailored investments ('asset specificity'), make it difficult to consider ex ante all of the possible 'consequential disturbances' that may emerge over the course of their execution.[62] The corresponding contracts are therefore inevitably incomplete.[63] This incomplete nature is, however, not a deficit to be overcome, but rather an inherent feature of complex and long-term contractual arrangements.[64] "Long-term incomplete contracts [therefore] require special adaptive mechanisms to effect realignment and restore efficiency when beset by unanticipated disturbances".[65] Although these adaptive mechanisms serve to perfect the contract between the parties, they also impose important restrictions on the autonomy of the parties at the same time. Suppose a scenario in which the specific investments are important and there is a significant risk of opportunism. In that case, transaction costs will be determinative, and a hierarchy may emerge, thereby justifying the expansion of control by the management of a firm.

If one is to adopt this 'natural order rhetoric', the identification of these different forms of organisation and of their corresponding regimes of contract law has important implications for competition law analysis and legal intervention in general. The restriction of the autonomy of some of the members of these hierarchies or network forms of organisation may simply be viewed as governance tools that seek to avoid organisational failures while generating transactional efficiencies. Consequently, in the absence of significant horizontal market power, competition law (or economic regulation) should not intervene, as this may compromise the internal organisation of this form of governance, the transactional efficiencies it brings along

[59] Oliver Williamson, 'Transaction-Cost Economics: The Governance of Contractual Relations', 22 Journal of Law & Economics 233-261 (1979). For a critique of the framing of organizational structures as lying on a spectrum between markets and the firm see Walter W. Powell, 'Neither Market nor Hierarchy – Network Forms of Organization', 12 Research in Organizational Behaviour 295-336 (1990).

[60] The term "hybrid" was first coined by Oliver Williamson, 'Transaction-Cost Economics: The Governance of Contractual Relations', 22 *Journal of Law & Economics* 233-261 (1979); see also O. Williamson, "Comparative Economic Organization: The Analysis of Discrete Structural Alternatives", (1991) 36 *Administrative Science Quarterly*, 269; C. Ménard, "The Economics of Hybrid Organizations", (2004) 160 *Journal of Institutional and Theoretical Economics*, 347–350.

[61] S. Deakin, C. Lane and F. Wilkinson, "'Trust' or Law? Towards an Integrated Theory of Contractual Relations Between Firms", (1994) 21 *Journal of Law and Society*, 334–35; I. MacNeil, "Contracts: Adjustment of Long-Term Economic Relations Under Classical, Neoclassical, and Relational Contract Law", (1978) 72 *Northwestern University Law Review*, 857. For an overview, see S. Grundmann & F. Cafaggi (eds), The Organizational Contract. From Exchange to Long-Term Network Cooperation in European Contract Law (Routledge, 2013).

[62] Oliver Williamson, 'Transaction-Cost Economics: The Governance of Contractual Relations', 22 Journal of Law & Economics 233-261 (1979).

[63] Oliver Williamson, 'Transaction-Cost Economics: The Governance of Contractual Relations', 22 Journal of Law & Economics 233-261 (1979); O. Hart, Incomplete Contracts and the Theory of the Firm, Journal of Law, Economics, and Organization 4 (1988), 119-139.

[64] Oliver Williamson, 'Transaction-Cost Economics: The Governance of Contractual Relations', 22 *Journal of Law & Economics* 233-261 (1979)

[65] Williamson, (1), 96.

with the entrepreneurial innovation generated by the digital platform. The intervention of competition law may be required to a higher degree in the context of networks than in one of hierarchies but under the 'natural order rhetoric', this higher level of importance would still not justify the State intervening.[66]

2. Resource-Based View of the Firm and Capabilities Approaches

A second theoretical pillar of the 'natural order rhetoric' comes from property rights theories of the firm, which emphasize the role of ownership and control rights over a bundle of complementary resources in shaping economic organization and behavior. These theories view various contractual restraints as control mechanisms for complementary assets, on a broader base than asset specificity[67]. As Hart points out, "in a world of transaction costs and incomplete contracts, *ex post* residual rights of control will be important because through their influence in asset usage, they will affect *ex post* bargaining power and the division of *ex post* surplus in a relationship", the division which will, in turn, "affect the incentives of actors to invest in that relationship".[68] By emphasising various parties' incentives to innovate, particularly those of digital platforms and/or ecosystem orchestrators, property rights approaches of the firm may serve to reinforce and even expand the call for forbearance and, thus, widen the scope of immunity from public governance (state) intervention.

RBV theories of the firm also stress the important explanatory potential of economic resources, but focus less on ownership and control rights and more on the *strategic use* of internal firm resources to explain the relevant firm's expansion.[69] These theories perceive firms as having idiosyncratic, not identical, strategic resources that are not perfectly mobile. The primary objective of business-level strategies developed at the firm level is to create sources of sustainable competitive advantage. These strategies build on the resources, assets and capabilities of firms. Assets can be physical (e.g. plant equipment, location, access to raw materials etc.), human (e.g. training, experience, judgment, decision-making skills, intelligence, relationships, knowledge etc.), and organisational (e.g. culture, formal reporting structures, control systems, coordinating systems, informal relationships etc.). The *capabilities* of a firm are usually considered to be a 'bundle' of assets or resources that perform a business process, each of which is composed of discrete individual activities. The firm's most important capabilities are called 'competences' and firms adopt strategies in order to gain a sustainable competitive advantage. These help a company to perform better than its rivals in the industry, and thereby ensure its ability to obtain and benefit from extraordinary profits for a significant period of time.

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[66] The distinction between networks and hierarchies should not be overstated. Networks may evolve towards a loose form of hierarchy as they are commonly subject to cyclical developments through which the most powerful participants may bring the network itself under their own control and, from that, create a hierarchical situation. See H. Thorelli, "Networks: Between Markets and Hierarchies", (1986) 7 *Strategic Management Journal*, 37.

[67] See, for instance, O. Hart, J. Moore. Property rights and the nature of the firm, (1990) 98(6) Journal of Political Economy 1119.

[68] O. Hart, An Economist's Perspective on the Theory of the Firm, (1989) 89 *Columbia Law Rev*iew 1757-1774, 1766.

[69] See B. Wernerfelt, "A Resource-Based View of the Firm", (1984) 5(2) *Strategic Management Journal*, 171; K. Prahalad and G. Hamel, "The Core Competence of the Corporation", (1990) *Harvard Business Review*, 79.

A number of the proponents of the 'forebearance' perspective for digital platforms have referred to capabilities as one of the dimensions that *explains* the power differential of Big Tech firms, compared to other firms, and *justifies* an increased space for private governance, instead of public governance frameworks, as the accumulation of such new capabilities promotes innovation[70].

The RBV focuses on the importance of knowledge buidling and the development of distinctive competences for a firm to do things (capabilities). This puts emphasis not only on the presence of dynamic learning effects which are internal to firms (e.g. personnel, trade secrets, internal organisation) but also to those external to it and which may refer to the relations the firm built with business partners (e.g. complementors in an ecosystem) and/or stakeholders (e.g. the government), all of which may be sources of value. Firms operate within a network of capabilities, with a set of capabilities distributed along the set of firms (nodes)[71]. Learning effects are crucial in most industries, and to the extent that learning gives rise to a special kind of intertemporal externality in production, this may generate dynamic scale economies in production[72].

However, this does not necessarily lead to embrace forebearance to the private governance arrangements in digital ecosystems as the appropriate regulatory strategy. Caffarra, Elliot and Galeoti have recently highlighted the chain of capability spillovers which may create competitive advantages across product markets[73]. But crucially, this emphasis on capabilities does not necessarily provide a direction as to a more or less permissive competition law enforcement policy, as one may take the view that *strategies* of raising rivals' costs or diminishing rivals' revenue may not enable competitors to develop such dynamic or ordinary capabilities in the medium to long term, with the result that the competitive process may suffer.

Prior beliefs as to the contestability of markets and the nature of competition in an industry and/or the central role of entrepreneurs may nevertheless influence the direction of competition law and policy.

3. Dynamic Capabilities and Contestable Markets Theory

Taking an evolutionary perspective on economic change, some authors emphasise the role of innovation leaders in the dynamic process of competition, distinguishing between firms that "deliberately strive to be leaders in technological innovations" and those that "attempt to keep up by imitating the successes of the leaders[74]. In their view, competition is not static but dynamic, and thus leads to a process of continuing disequilibrium fundamentally different from

[70] D. Teece, "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy", (1986) 15(6) Research Policy, 285; D. Teece, "Business Models, Value Capture and the Digital Enterprise", (2017) 6(8) Journal of Organizational Design, https://doi.org/10.1186/s41469-017-0018-x

[71] J. Chen, Jun, M. Elliott, & A. Koh, Capability Accumulation and Conglomeratization in the Information Age (2016). Available at SSRN: https://ssrn.com/abstract=2753566.

[72] P. Dasgupta & J. Stiglitz, Learning-By-Doing, Market Structure and Industrial and Trade Policies, (1988) 40 Oxford Economic Papers 246.

[73] Caffarra, Elliot & Galeoti, Ecosystems theories of harm in digital mergers: New Insights from Network Economics, Part 2, VOXEU, CEPR (June 6, 2023), available at https://cepr.org/voxeu/columns/ecosystem-theories-harm-digital-mergers-new-insights-network-economics-part-2.

[74] R. N. Nelson & S. G. Winter, *An Evolutionary Theory of Economic Change* (Harvard Univ. press, 1982), 275.

the static price competition depicted by neoclassical price theory leading to the elimination of the less innovative firms and tipping the market to the innovation leaders. The market structure thus evolves to one involving large firms with considerable degree of market power, but this is "the price that society must pay for rapid technological advance" as these firms have the 'capability advantages' in terms of risks spreading, economies of scale in R&D, financial resources for taking care of the sunk costs of the research, and the 'appropriability advantages' for better protecting their innovations[75]. In essence, the argument is that the static costs of a concentrated market structure and the exercise of market power may lead to welfare losses because of output restriction (and higher prices). However, these losses may be traded-off by a faster rate of growth of productivity because of investments in innovation and pushing even further the production possibility frontier of the specific economy. These approaches put forward the need to protect the incentives of large firms to innovate, on the assumption that these will invest their profits in R&D.

In this view, the constitution and consequent orchestration of a digital ecosystem may entail the bundling of resources and capabilities that one firm would be unable to provide or to get from the market[76]. For instance, regarding digital ecosystems, the process of assembling value through the creation of datasets merging different types of data (structured and unstructured), integrating location data with customer data or public data with private data may enable the conversion of the intangible value of data into real value[77]. Quite often this monetisation occurs by selling this data to a group of consumers with indirect network externalities to the group of consumers whose data has been the input of the value chain: the first group of consumers is more willing to 'be on board' if they expect the other group of consumers to be equally popular. Data monetisation requires 'high technical data capabilities' (e.g. network capacities enabling the collection, storage and retrieval of data) and 'high analytical capabilities' (the analytical skills needed to exploit the data). Of course, there are different possibilities for monetisation and various business models. By acquiring a large customer base, firms are also able to develop dynamic capabilities in prediction (for instance, the firm may use consumer data to enable it to improve its algorithms).

Assuming that digital platforms are technology-intensive, these authors argue in favour of putting at the centre of the competition law analysis dynamic Schumpeterian competition, acknowledging that a firm´s dominant position may be quickly eroded by new, innovative firms that enter the market[78].

These led them to advance a greater reliance on self-regulation and private governance regimes, as greater intervention by the State may jeopardised dynamic efficiencies, the 'goose

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[75] Ibid., p. 278.

[76] D. Teece, G. Pisano, and A. Shuen, 'Dynamic Capabilities and Strategic Management' (1997) 18 *Strategic Management J* 509; S Winter, 'Understanding Dynamic Capabilities' (2003) 24 *Strategic Management J* 991; N.J. Foss, J. Schmidt, D.J. Teece, Ecosystem leadership as a dynamic capability, (2023) 56(1) Long Range Planning 102270.

[77] L. Taylor, H. Mukiri-Smith, T. Petročnik, L. Savoilainen & A. Martin, (Re)making data markets: an exploration of the regulatory challenges, (2022) Law, Innovation and Technology, https://doi.org/10.1080/17579961.2022.2113671.

[78] See, for instance, J. G Sidak and D. Teece (2009). Dynamic Competition in Antitrust Law, Journal of Competition Law & Economics, 5 (4), pp. 581-631; D. Teece, "Next-Generation Competition: New Concepts for Understanding How Innovation Shapes Competition and Policy in the Digital Economy", (2012) 9 Journal of Law & Policy.

that laid the golden eggs'. Greg Sidak and David Teece have argued for a "neo-Schumpeterian framework for antitrust analysis that favors dynamic competition over static competition [that] would put less weight on market share and concentration in the assessment of market power."[79]

Taking an evolutionary perspective, others argue that in an industry marked by cumulative innovation, "a more sheltered competitive environment, with its associated higher mark-ups, does lead to more rapid productivity growth!"[80]. In the presence of innovation, welfare losses because of output restriction (and higher prices) may be traded-off by a faster rate of growth of productivity. Here, it is the demand schedule of the market that is shifted outward to the right as a result of product innovation, highlighting the fact that consumers have high willingness to pay for the new generation of products which, therefore, supplants the current generation.

Drawing on this broader theoretical framework, David Teece, among others, has put emphasis on dynamic capabilities as an important element defining competitive rivalry[81]. Dynamic capabilities are defined as "the firm's ability to integrate, build, and reconfigure internal and external resources/competences to address and shape rapidly changing business environments" to generate 'abnormal returns': these are "rooted in certain change routines (e.g., product development along a known trajectory) and analysis (e.g., of investment choices)" but more commonly rooted in "creative managerial and entrepreneurial acts (e.g., pioneering new markets)"; "(t)hey reflect the speed and degree to which the firm's idiosyncratic resources/competences can be aligned and realigned to match the opportunities and requirements of the business environment"[82]. The emphasis is not only given in the creation of value but also its co-creation to the extent that the firm "has to orchestrate activities and resources/assets within the system of global specialisation and cospecialisation"[83]. From this perspective, "(b)usiness models, dynamic capabilities, and strategy are interdependent"[84].

In this view, competition policy that would focus on innovation should escape the market structure-innovation 'trap' and should focus on dynamic competition as a process in which entrepreneurs and entrepreneurial managers are important actors (to the extent that, as they assume, these are key for the generation of dynamic capabilities)[85]. This leads these authors to distinguish between different forms of monopoly rents, some of which are beneficial

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[79] G.J. Sidak and D.J. Teece, Dynamic Competition in Antitrust Law, (2009) 5(4) Journal of Competition Law & Economics 581.

[80] R. N.Nelson & R. Winter, *An Evolutionary Theory of Economic Change* (Harvard Univ. press, 1982), 350. The same authors remark that "[. . .] Schumpeterian competition selects both on inventions and on firms, and molds market structure as well as the flow of technology. But it also proceeds in part through conscious social policy. Thus, for example, antitrust laws were put in place to prevent or retard the growth of concentration". However, the authors also raise the possibility that an industry dominated by a large firm that has "lost its innovative prowess" and by imitating competitors, barricades the industry "from the entry and growth of small innovators" in particular in sectors where experience counts.

[81] See, among many, D. Teece, The Evolution of the Dynamic Capabilities Framework, In: Adams, R., Grichnik, D., Pundziene, A., Volkmann, C. (eds) Artificiality and Sustainability in Entrepreneurship. FGF Studies in Small Business and Entrepreneurship. Springer, Cham, available at https://doi.org/10.1007/978-3-031-11371-0_6; D. Teece & G. Pisano, The Dynamic Capabilities of Firms: An Introduction, WP-94-103 October 1994 (IIASA).

[82] D. Teece, Handbook on the Economics of Innovation, Vol. 1 (2010), Section 4.3.

[83] Ibid.

[84] D. Teece, Business Models and Dynamic Capabilities, (2018) 51(1), available at: https://www.sciencedirect.com/journal/long-range-planning", 40-49.

[85] See, for instance, N. Petit & D. Teece, Innovating Big Tech firms and competition policy: favoring dynamic over static competition, (2021) 30(5) Industrial and Corporate Change, 1168.

for welfare as they incentivise investment in innovation[86]. Dynamic capabilities often give rise to Schumpeterian rents and abnormal returns, while 'ordinary capabilities' and RBV approaches may be associated with Ricardian rents[87].

This perspective also indirectly relies on contestability theory to provide a substitute for the theory of perfect competition applicable in a world characterized by scale economies or multiproduct firms, the benefit here being that the theory does not focus on price-taking as the characteristic of a perfectly competitive static welfare-enhancing market, but instead adopts the possibility of entry as a superior more dynamic-oriented welfare standard[88]. This theory therefore examines the possibility of rapid entry and exit (that is, potential competition) to eliminate technical inefficiencies and excess profit. However it does not consider elements of strategic interaction linked to entry deterrence[89].

The framework put forward highlihghts the importance of potential competition, but not based on a precautionary principle that would aim to keep ecosystems open (after all it assumes away strategic entry deterrence), but with the view that to the extent entry is possible, certain rents (be it Schumpeterian or Ricardian) are merits-based and therefore fully justified, or even necessary in order to incentivise innovation. This is where the chosen analytical heuristic of ecosystems has immediate normative implications: In this view, to the extent that potential competition may eventually eat out monopoly rents of digital platforms, competition law intervention is not warranted. Put simply, the dynamic competition structure of the digital economy game dominates (or even controls for the impact) of digital platforms' strategy (agency).

B. The 'Power Rhetoric'

The 'natural order rhetoric' is growingly challenged by an opposing rhetoric that emphasises the role of *strategic intention* in the behaviour of ecosystem orchestrators and in particular the power positioning strategies they may be inclined to follow. In this line of argument, the *agency* (of orchestrators) dominates the *structure* of competition in the digital economy. Such structures are hence *made* by key actors, rather than a *given* outcome of the competitive process. These actors may favor central platform orchestration over other governance modes even where it is disadvantageous to the ecosystem's value creation, if it

[86] N. Petit & D. Teece, Innovating Big Tech firms and competition policy: favoring dynamic over static competition, (2021) 30(5) *Industrial and Corporate Change*, 1168, 1182. The authors distinguish between three kinds of rents: Monopoly rents reflecting "returns arising from restrictions on output placed on other firms" (which are considered as negative for welfare), Ricardian rents related to scarcity reflecting "returns to assets whose supply is fixed over a finite time horizon" (higher productivity), and Schumpeterian rents reflecting "returns arising from the introduction by entrepreneurs (and entrepreneurial businesses) of new combinations, improvements, or methods of production" (higher innovativeness).

[87] N. Petit & D. Teece, Innovating Big Tech firms and competition policy: favoring dynamic over static competition, (2021) 30(5) *Industrial and Corporate Change*, 1168, 1183.

[88] WJ Baumol, JC Panzar, and RD Willig, *Contestable Markets and the Theory of Industry Structure* (Harcourt Brace Jovanovic, 1982)

[89] See, M. Spence, Review: Contestable Markets and the Theory of Industry Structure: A Review Article, (1983) 21(3) Journal of Economic Literature 981, 982 & 988 (noting that contestability theory "deliberately" neglects market structures in which investments lead to sunk cost that may give rise to strategic or game theoretic problems and assumes that entry barriers lack permanence and durability, the theory providing "descriptive analysis in industries in which the good is perishable (services) and in which sunk costs are minimal".).

strengthens their power position and enhances their value capture. This rhetoric also has direct policy implications for the ideal reach of different regulatory mechanisms and systems of public governance.

1. The Social and Institutional Architecture of Digital Ecosystems

Contractual or other internal governance instruments developed by digital platform and ecosystem orchestrators can form part of a strategic effort to limit competition by raising barriers and marginalising competing platforms and ecosystems through strategic foreclosure in order to gain relative (in some cases even absolute) competitive advantage. This, first limits horizontal competition and results in one firm obtaining and exploiting market power, leading to important consumer welfare and broader well-being losses as well as to the emergence of even more centralised economic structures. Such strategies may also impact vertical competition, which relates more to distributional effects in the re-allocation of the surplus value or 'pecuniary externalities' resulting from important asymmetries in the capture of the value generated by digital innovation between ecosystem orchestrators, complementors and consumers.[90]

The multi-dimensionality of the economic (and political/cultural) power of digital platforms has led to the emergence of social movements employing the 'power' or 'domination rhetoric' in order to challenge the space offered, for a long period of time, to private governance, in favour of a more extensive reliance on public governance mechanisms for digital platforms. The initial focus has mostly been on the largest platforms (Big Tech), but also smaller ones, in view of their effect on the tangible economy as central platforms powering ecosystems to which participate thousands of firms, but also more broadly on the democratic process[91].

Others have argued that the 'ecosystemic mindset' that is very much based on the social relationships that develop between the various actors cooperating within the ecosystem goes in pair with a multi-dimensional definition of 'value', which recognises the contribution to the value generation process of various stakeholders.[92] In this view, capabilities do not only result from the meritorious investments, strategies and business models of a specific keystone firm[93] in the value chain but result from a social process of co-production of value among multiple contributors, among them socio-economic agents participating to the ecosystem in question (business partners/complementors (e.g. suppliers of inputs), users, the local community, the

[90] The latter impact, according to NeoClassical Price Theory (henceforth, 'NPT'), should be ignored by competition law as it does not relate to economic efficiency.This is the main lesson of the 'Coase Theorem', which proceeds on the basis of a world of zero transaction costs and individuals being able to bargain and internalise technological externalities, and thus leaving aside pecuniary externalities: R. Holcombe and R. Sobel, "Public Policy Toward Pecuniary Externalities", (2001) 29(4) Public Finance Review, 304.

[91] K. Sabeel Rahman, *Democracy Against Domination* (OUP, 2017); L. Khan, The New Brandeis Movement: America's Antimonopoly Debate, (2018) 9(3) *Journal of European Competition Law & Practice*, 131; B. Rogers, The Social Cost of Uber, (2015) 82 University of Chicago Law Review Dialogue 85.

[92] I. Lianos, Value extraction and institutions in digital capitalism: Towards a law and political economy synthesis for competition law. *European Law Open*. 2022;1(4):852-890. doi:10.1017/elo.2023.

[93] M. Iansiti & R. Levien, *The Keystone Advantage - What the New Dynamics of Business Ecosystems Mean for Strategy, Innovation, and Sustainability* (Harvard Business School press, 2004).

State etc.).[94] This set of actors can be labelled the value ecosystem *lato sensu*. Capabilities (either dynamic or ordinary) may thus not only be associated with lead/keystone firms, whose innovation incentives should not be stifled, but are also developed at the level of the ecosystem *lato sensu*, that is, the broader community co-producing value.

These social costs generated by ecosystems do not only relate to 'value network failures' in the narrow sense that the 'natural order rhetoric' has recognised, but because of this broader perspective on who are the stakeholders in an ecosystem, may extend beyond the usual focus on orchestrators and complementors, and concern users (end-consumers), but also local communities and citizens, to the extent that digital ecosystems often include thousand of firms and have significant impact on economic activity in various industries. Functional and distributional failures may affect a number of stakeholders that are not usually adequately represented in the institutions of private governance of ecosystems. This may impose externalities on them, to the extent that their contribution to an ecosystem or the costs incurred by membership in an ecosystem are not factored in a situation in which such ecosystems (*stricto sensu*) will be only accountable to the shareholders of the orchestrator and complementor firms. Such externalities may result from a lack of competition, due to positions of architectural power or innovation bottlenecks, for example, or be broader to include eg social and psychological externalities[95].

From this perspective, examining who wields power in the ecosystem and how this power affects not only consumers but also all those who contribute to the socio-economic value of the ecosystem, as well as various dimensions such as innovation, requires the development of new approaches focusing on power positions at the level of the ecosystem or that of the value chain[96]. Focusing on value chains, instead of individual market transactions, brings to the fore the importance of the social structure of economic activity. Economic sociology has provided important insights as to the social architecture of markets, and the role of 'market devices' and 'market agencements' that structure and provide meaning and performance criteria to economic exchanges and may be an important source for competition law and regulation[97]. This research should be expanded as it provides a fertile framing to identify, normatively and empirically, the novelty and stakes in regulating (digital) ecosystems.

The power narrative is not limited to the only issue of the social performance of (digital) ecosystems and how these may contribute to sustainable innovation; it also needs to integrate an institutionalist component that remains at the background of the discussions but is not explicitly put forward. This is related to the idea that although ecosystems have emerged as stable institutions of the meso-level relying mostly on institutions of private ordering to

[94] Note the importance of State investment in the emergence of modern digital ecosystems, see M. Mazzucato, *Mission Economy: a Moonshot Guide to Changing Capitalism* (Harper Business, 2021).

[95] M.G. Jacobides, C. Cenammo, A. Gawer, Externalities and complementarities in platforms and ecosystems: From structural solutions to endogenous failures, (2024) Research Policy 104906, 7.

[96] I. Lianos, B. Carballa-Smichowski, A Coat of Many Colours – New Concepts and Metrics of Ecoomic Power in Competition Law and Economics, *Journal of Competition Law & Economics*, 2022; nhac002, https://doi.org/10.1093/joclec/nhac002.

[97] See I. Lianos,Minding Competition Law in Complex Adaptive Social Systems – The Sociology Approach to Competition Law (CLES Research papers 1/2024)). For a good overview of recent strands of economic sociology in their connection to legal debates cf S. Frerichs, Transnational Law and Economic Sociology, in P. Zumbansen (ed), Oxford Handbook of Transnational Law (Oxford: OUP, 2021) 67.

structure interdependencies and cooperation they may not be sufficiently embedded into the broader sociopolitical instrumental value system that a polity may wish for in implementing its social contract.[98] Put simply, there may be limits in the collective action ability of ecosystems perceived as only institutions of private ordering to properly adjust to the basic conditions of the complexity of mixed interests that should often be mediated in a political community. Or, more provocatively, certain ecosystems even deliberately seek to immunize themselves towards wider political processes, eg by occupying a transnational space and trying to evade national and territorial rules. What is needed is a complex policy system that will sway private agents in complex socioeconomic systems of the meso level (ecosystems) to offer social value (internalising any negative social externalities), and also by the same avoid situations of 'ceremonial dominance' that may lead to situations of innovation sclerosis and exploitative locked in (see Section V.).

From this perspective, the expansion of (digital) ecosystems in different socio-economic and cultural spheres powered by network effects does not always indicate their success as institutions of the meso-level, to the extent that even if achieving a minimum size may be a condition for success in networks (minimum scale), the world is also too complex for having only a few large size systems. Consider only the importance of resilience and minimisation of the costs of high impact, low probability events in an era of global disruptions, to the extent that systemic resilience or social and environmental sustainability and economic democracy (or polyarchy) form part of the goals/public values promoted by the specific polity. In other words, there may be not only disadvantages of the small size but also of the large size, depending on the public value(s) in question. What needs to be done is therefore to connect the question of the appropriate scale to the instrumental values pursued by the specific socio-political community, a complex issue that may not be solely answered by the fact that (digital) ecosystems and its private ordering continue to expand; it involves a deeper understanding of the broader value systems they form part.

2. A Global Value Chain Perspective: Navigating Organizational Complexity and the Construction of Value

The focus of the RBV on strategy and the conceptualisation of the firm's organisation as being related to the implementation of modular tasks have also inspired the global value chain (henceforth, the 'GVC') literature[99]. There is an important difference however between the GVC approach and that of the RBV: the GVC approach takes more fully into account the

[98] The concept of (social) embeddedness is discussed by Mark Granovetter, 'Economic Action and Social Structure: The Problem of Embeddedness', 91 American Journal of Sociology, 481-510 (1985)

[99] Note that firm-level analysis and particularly works pertaining to institutional economics and relational contracting, such as those of Williamson and MacNeil by focusing on an awareness of the plurality of chain structures and actors, has permitted legal scholars of contract and business law to more easily accept the regulating function of GVCs. See F. Cafaggi, "The Regulatory Functions of Transnational Commercial Contracts: New Architectures", (2013) 36 *Fordham International Law Journal*, 1557; F. Cafaggi and P. Iamiceli, "Contracting in Global Supply Chains and Cooperative Remedies", (2015) 20 Uniform Law Review 20, 135; F. Cafaggi and P. Iamiceli, "Private Regulation and Industrial Organisation" in *Contract Governance* (edited by S. Grundmann, F. Möslein and K. Riesenhuber, Oxford University Press 2015), 343. For a comparative conceptual history of relational contracting, see K.H. Eller, Comparative Genealogies of "Contract and Society", (2020) 21 German Law Journal 1393.

broader value communities that are engaging in this co-production effort and integrates not just values of private governance, such as efficiency in the use of the resources (which in the neoliberal context are valued from the only perspective of the shareholders' wealth-maximisation principle), but also an emphasis on the relations of power underlined by specific types of governance, while also paying attention to the goals and values pursued by public authorities (linked to a broader stakeholders' well-being maximisation principle or more generally the concept of common good in the specific polity).

GVC theory also breaks with the 'natural order rhetoric' of the TCE and property rights' approaches and their belief that private governance systems emerge organically in view of the specific characteristics of transactions, or the technology employed, from which stems the assumption that they are efficient. GVC approaches take a more intentionalist perspective focusing on deliberate strategies of value capture, and bringing to the center of the discussion the distribution of value among economic (and non-economic) actors, whose interests may be affected by the value chain. In other words, at least parts of GVC literature have fully internalized the situatedness of every actor in the chain and include regulators, civil society organizations, unions, business organizations and others in its analysis. Furthermore, while the RBV focuses on specific resources, technological, economic, strategic etc., the GVC approach describes an organisational reality.[100] Economic trends of outsourcing, offshoring and vertically integrated trade are reflected in an organisational form that, unlike previous cases of an "international division of labour",[101] have become institutionalised to such a high degree that they actually form the 'central nervous system' of the world economy and form the organisational backbone for the generation of value in the global economy[102].

One of the key additions of the scholarship on GVCs centres on the 'value-added' concept and in particular how the surplus value delivered by global value chains is spread across jurisdictions [103], a concern that is also familiar with the discussions over industrial policy and the global political economy and 'geography' of Big Tech platforms and technology firms, Europe being behind the United States and China[104]. Closely linked to the value-added concept is also that of 'upgrading', i.e. the objective of actors within the relevant chain to move towards being the more value-adding segments of a chain (i.e. 'economic upgrading') and improving the social quality of employment, such as wages, workplace safety and inclusion etc. (i.e. 'social upgrading').[105]

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[100] R. Kaplinsky, "Global Value Chains, Where They Came From, Where They are Going and Why This is Important", (2013), Innovation Knowledge Development Working Paper No. 68, 8.
[101] F. Fröbel, J. Heinrichs and O. Kreye, *Die Neue Internationale Arbeitsteilung (The New International Division of Labour)*, (1977).
[102] O. Catteneo, G. Gereffi and C. Staritz, "Global Value Chains in a Post-Crisis World: Resilience, Consolidation and Shifting End Markets" in *Global Value Chains in a Post-Crisis World: A Development Perspective* (Washington, 2010), 3 and 7.
[103] R. Kaplinsky, "Spreading the Gains from Globalisation", (2004) 47 *Problems of Economic Transition*, 74.
[104] See, among others, A. Bradford, *Digital Empires* (OUP, 2023); O. Andriychuk, Between Microeconomics and Geopolitics: On the Reasonable Application of Competition Law, (2022) 85(3) Modern law Review 598.
[105] See S. Barrientos, G. Gereffi and A. Rossi, "Economic and Social Upgrading in Global Production Networks: A New Paradigm for a Changing World", (2012) 150 *International Labour Review*, 319; T. Bernhardt and R. Pollak, "Economic and Social Upgrading Dynamics in Global Manufacturing Value Chains", (2016) 48 *Environment and Planning*, 1220.

Individual countries rely on the GVC framework to explore chances of 'upgrading', i.e. the capturing a more significant share of a given value chain by providing those services that add a relatively larger part of value or to ensure they maintain their 'digital sovereignty'. In addition to this, international organisations have drawn on the GVC framework to assess cross-cutting issues of economic development, trade and investment policies, relating to broader public values such as sustainability, workers' rights, waste and resource circulation as well as gender equality and inclusion.[106] More generally speaking, GVC analysis has become a heuristic to understand the interconnected spatial and temporal nature of global economic activity and enables one to observe dynamics between seemingly unrelated norms, actors and processes. From this perspective, GVCs invite fundamental questions of agency and accountability, in particular for lead firms.

3. Dual Role of Private Governance in the GVC Framework

Private governance in the GVC framework provides the legal and other instruments that animate the value chain, but also more broadly connects chain actors with one another in order to accomplish an integrated economic process (or "the focal value proposition" in the business ecosystems jargon[107]). Such governance regimes can encompass contracts but they can also go further and include business routines and practices, logistics, reporting documents and practices, as well as reputation and trust.[108] Functionally, private governance regimes combine elements of legislative, administrative and adjudicative power.[109] Substantively, private governance regimes set standards of cooperation, stipulate information rights, make allowance for on-site visits and reporting duties, permit the transfer of intangible and other assets and, generally, allocate risks related to incidents along the value chain. Besides this role in institutionalizing the economic rationality of production, private governance in the GVC has increasingly been used to make up for deficits in public regulation, particularly in the fields of product safety, environmental protection, labour rights and, more recently, data protection. The integration of such concerns into pre-existing and novel instruments of private governance has not been without conflict and the effectiveness of a private implementation of public goals has so far proven controversial.[110] Despite this skepticism, private governance today pertains both to the animating *and* the regulating dimension of private instruments within GVCs. This broader conception of the role of private governance resonates with the business studies and

[106] See Organisation for Economic Co-operation and Development ('OECD'), *Interconnected Economies: Benefiting from Global Value Chains*, (OECD Publishing, 2013); International Labour Organisation ('ILO'), "Decent Work in Global Supply Chains: Resolution and Conclusions Submitted for Adoption", (2016) Report for International Labour Conference 105th Session, 14-1; OECD and World Bank Group, "Inclusive Global Value Chains", (2015), Report for Submission to G20 Trade Ministers Meeting Istanbul.
[107] R. Adner, Ecosystem as a Structure: An Actionable Construct for Strategy, (2017) 43(1) Journal of Management 39, 40.
[108] M. Vandenbergh, "The New Wal-Mart Effect: The Role of Private Contracting in Global Governance", (2007) 54 *UCLA Law Review*, 913.
[109] L. Bernstein, "Opting Out of the Legal System: Extra-Legal Contractual Relations in the Diamond Industry", (1992) 21 *Journal of Legal Studies*, 115-157.
[110] R. Locke, *The Promise and Limits of Private Power: Promoting Labour Standards in a Global Economy*, (Cambridge University Press, 2013).

economics emphasis on the regulating role of orchestrators or multi-sided platforms in digital ecosystems[111].

What is however missing from the ecosystems business literature is a more serious engagement with the modes of power in ecosystems. Although the concept of "industry architecture" considers how (lead) firms shape rules and roles in their ecosystem, and engages with the structural features of centralised private governance and ecosystem orchestration[112], there has not been so far any effort to develop a more elaborate typology or theory of private governance in (digital) ecosystems, at least to the same level of sophistication as it has been done in the GVC literature. In their leading typology on GVC governance modes, Gereffi, Humphrey and Sturgeon consider three essential variables when describing governance and changes in GVCs:[113] (i) the complexity of transactions, (ii) the ability to codify transactions, and (iii) the capabilities of the supply-base. Such typology was crucial to mark the opposition of the GVC literature to Ronald Coase's dichotomy between the firm and the market, and to highlight the emergence of network forms of governance in between these two poles. Drawing on institutional economics and production network theories, the typology first provides an explicit account as to how coordination across a geographically dispersed network of suppliers is even possible, with as important explanatory factors the combination of institutional innovation, the flexibility of the free market, and the trust and stability generated by long-term contractual relationships. Second, it helps distinguish between five analytical (not strictly empirical) discrete types of governance: (i) markets, (ii) modular value chains, (iii) relational value chains, (iv) captive value chains, and (v) hierarchy. It also identifies three principal parameters for each type of governance: (i) the complexity of information and knowledge transfer required for a particular transaction, (ii) the degree of codifiability of this information and knowledge, and (iii) the capabilities of the supplier base in relation to the requirements of the transaction, in order to gauge the degree of explicit co-ordination and power asymmetry between the GVC members (see Table 1).[114]

Table 1: GVC Governance Types[115]

Governance Type	**Complexity of Transactions**	**Ability to Codify Transactions**	**Supply-Base Capabilities**	**Degree of Explicit Co-ordination and Power Asymmetry**
Market	Low	High	High	Low

[111] K.J. Boudreau & A. Hagiu, Platform Rules: Multi-Sided Platforms as Regulators, in A. Gawer (ed.), *Platforms, Markets and Innovation*, (Edward Elgar Publishing, 2009).
[112] See, e.g. M.G.Jacobides, T. Knudsen, M. Augier Benefiting from innovation: Value creation, value appropriation and the role of industry architectures, (2006) 35(8) Research Policy 1200; G.P. Pisano, DJ.Teece, How to capture value from innovation: shaping intellectual property and industry architecture, (2007) 50(1) California Management Review 278–296.
[113] G. Gereffi, J. Humphrey and T. Sturgeon, "The Governance of Global Value Chains", (2005) 12 *Review of International Political Economy*, 78-104.
[114] *Ibid*, 87.
[115] *Ibid*, 87.

Modular	High	High	High	
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	High

For instance, in modular value chains, buyer and supplier relationships are usually governed by a price-based, market-type structure, in which both actors share knowledge of common standards. Such chains are characterised by highly complex but also highly codifiable information. This enables buyers to find a capable supply base even for complex requirements as is exemplified by the turnkey supply business model, which accomplishes demanding production without particular oversight.

Relational value chains occur in which no shared standards—that could easily be codified—exist. Hence, quality commands require closer co-operation between the buyer and the seller and such will be based on a combination of mutual trust, information exchange, reputation and particular contractual regimes. Typically, relational value chains will be found in relation to the development of new products or prototypes.

Captive value chains can be found in situations in which a supplier's capabilities are relatively low but the possibility of undertaking some form of codification along with the high degree of complexity of the relevant production process are high. Here, the supplier needs to co-operate with the buyer as the supplier cannot easily switch to different markets.

Based on this matrix, it becomes possible to identify the way in which common dynamics, with respect to one or several of these parameters (for example, an increase in the complexity of transactions), can impact upon the governance structure of the value chain[116], but also to understand how private governance may evolve according to the characteristics of the transactions, the potential of a regulating role being exercised, and the economic capabilities of the GVC members. Although the type of governance is not a constitutive element of an 'ecosystem'[117], and as we previously explained a centralised ecosystem orchestration is not the only governance option available, the GVC analytical governance matrix may provide some inspiration to the study of the typology of (digital) ecosystems.

4. The Explanatory Potential of the GVC Approach

From a descriptive perspective, the GVC framework provides a useful methodology to map the various actors co-operating in a particular value chain and to evaluate the power dynamics between them. It is for this reason it has been widely used to investigate the parameters that impact upon issues of participation, rent distribution, and development. Similarly, it has helped to identify the level of innovation concerning different types of normativity and private ordering, ranging from the informal to more formalised types[118], thus helping to understand not just indirect forms of interaction between economic agents via the

[116] *Ibid*, 90.
[117] C.Y. Baldwin, M.L.A.M. Bogers, R. Kapoor, J. West, Focusing the ecosystem lens on innovation studies, (2024) 53 Research Policy 104949.
[118] F. Mayer and G. Gereffi, "Regulation and Economic Globalization. Prospects and Limits of Private Governance" in *Global Value Chains and Development* (edited by G. Gereffi, 2018), 253-275.

intermediation of markets (under the assumption that the agents make decisions in full autonomy from each other by maximizing their objective functions in complete isolation), but also direct interactions, GVCs being considered as (local) formal or informal institutions that support different dimensions of economic exchange than costs and prices, such as quality. For example, relatively early on, the GVC framework highlighted the way in which technical and process standards are used by lead firms in order to reduce the complexity of the relevant chain.[119] Unlike market-type relations, which are essentially governed by price information, such standards can be used for the purpose of codifying non-price information in order to organise coordination. By way of analogy, in the field of digital value chains, different means of cooperation have been introduced into the code design as technical infrastructure of platforms and communicative interfaces between systems, for example application programming interfaces (henceforth, 'APIs'), for instance to ensure cybersecurity or compliance with privacy norms. Equally, the firm-level approach and its 'de-territorialisation' of production concepts have not remain uncontested within the GVC analysis itself – scholars have submitted that there is a stronger combination of micro- and macro-level factors that need to be taken into account and, crucially, broader entry points of political economy need to be considered.[120] There lies the distinct contribution of the GVC approach, as it enables, from a prescriptive perspective, to integrate a broader set of instrumental values that need to be taken into account in order to gauge institutional evolution.

5. Defining the Right Unit of Analysis for Public Policy Purposes

When seeking to apply the GVC framework to digital value chains and ecosystems (or draw inspiration from it), its promising explanatory potential as well as its limitations, including some more obvious and some less obvious ones, become clear. Interestingly, the shift from 'digital value chains' to 'ecosystems' seems to be linked to the internal debate occurring within the value chain literature. In this debate, some have suggested that the concept of 'global production networks' should replace the 'value chain' concept.[121] In advocating this novel concept, scholars have sought to: (i) more accurately express the nodal, non-linear agency structures in a production process ('network' rather than 'chain'), and (ii) link the analysis of governance modes to Foucauldian studies on governmentality, informal norms and shared normative practices. The term 'ecosystem' is used to depict highly dynamic types of 'entangled alliances' between companies, irrespective of their regional and sectoral attribution, with these alliances being characterised by both path dependency and a high level of volatility.[122] It

[119] S. Ponte and P. Gibbon, "Quality Standards, Conventions and the Governance of Global Value Chains", (2005) 34 *Economy and Society*, 1-31.
[120] See Bair, (26), 153-180; P. Dicken, P. Kelly, K. Olds and H. Wai-Chung Yeung, "Chains and Networks, Territories and Scales: Towards a Relational Framework for Analysing the Global Economy", (2001) 1 *Global Networks*, 89-112.
[121] See N. Coe, P. Dicken and M. Hess, "Global Production Networks: Realizing the Potential", (2008) 8 *Journal of Economic Geography*, 271; N. Coe and H. Yeung, *Global Production Networks* (Oxford University Press, 2015).
[122] J. Meffert and A. Swaminathan, "Management's Next Frontier: Making the Most of the Ecosystem Economy", *mckinsey.com*, <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/managements-next-frontier>.

describes a constellation of products, organisations and people across various industrial clusters connected through a digital platform. Ecosystems sell holistic 'outcomes', such as access to safe mobility, rather than fragmented products, such as automotive, service plans and insurances. However, "ecosystems" and "platforms" should not be conflated, although the two are interlocked. As explained by Jacobides et al., "a platform usually entails an ecosystem, and an ecosystem often rests on a platform"[123]. Nonetheless, when transposing the GVC framework one needs to be aware of its limitations. The typology espoused corresponds to a firm-level analysis that largely brackets both meso and macro-level impacts as well as inter-personal preconditions, such as inculturation practices of supply chain managers. Even more crucially, the role of data and data analytics (such as AI capabilities) is a significant lacuna, in terms of explaining both digital value chains and data-driven manufacturing. Data, and access to it or to capabilities of analyzing it, has become both the currency of power along the chain and the decisive factor in relation to the distribution of rents in digital ecosystems.

In order to fruitfully mobilize the GVC framework for digital ecosystems, some adjustments are therefore necessary as will be outlined in the following sections.

First, the business model and operating logic of platforms is embodied in private governance structures. Hence, the role of private governance is different and even more crucial than in the world of (non-digital) value chains. In physical production, the value chain has become an instrument for optimising profitability in the production of a given good and private governance has been used to orchestrate production resources to realise the potential benefits from outsourcing. Under the 'lean production' paradigm, value chains can be sub-divided relatively easily into linked sequences and/or delivery steps. In digital ecosystems, private governance does not only enable platform operability, it brings the ecosystem operability into being. Put simply, it *constitutes* the "product", rather than merely *optimising* its production. If in a GVC context, products are separated from the agents engaged in the exchange, as their quality being stabilized by conventions and standards defined at the level of the value chain, the ecosystem glue (the "product" in this case) is shaped by the links between the agents who enter into relationships[124].

Secondly and consequently, the fragmentation of product value chains into different 'tiers' is not reflected in digital ecosystems. Instead of sequences of production, known as 'tracing a commodity', the data value chain can be modelled around steps concerning the treatment of the data, specifically data acquisition, analysis, curation, storage and usage.[125] Once a platform is in place, these steps coincide and, therefore, it is necessary to model the business context and relationships between key stakeholders, both of which are not premised on the tracing of a single information package as it would be in the physical production field.

Thirdly, in the field of (digital) ecosystems, divisions between classical business sectors seem much more fluid. This is primarily due to the use of easing data, which can criss-cross these sectoral boundaries. Platform business models are not oriented towards a stable final product (e.g. an automobile), but are dynamic in and of themselves with easily moving sectors

[123] M.G. Jacobides, C. Cennamo, A. Gawer, Externalities and complementarities in platforms and ecossytems: From structural solutions to endogenous failures, (2024) (53) Research Policy 104906, 4.
[124] L. Boltanski & E. Chiapello, *The New Spirit of Capitalism* (Verso, 2007), 129-130.
[125] E. Curry, "The Big Data Value Chain: Definitions, Concepts, and Theoretical Approaches" in *New Horizons for a Data-Driven Economy* (edited by J. Cavanillas, E. Curry and W. Wahlster, Springer, 2016), 32.

to which new ones can be added (e.g. an e-commerce platform that also engages in financial services). This is significant from a value chain perspective. Such perspective cannot be centred around a final product or 'core competence', rather it has to account for the openness or elusiveness of the 'final product' through focusing on processes and capabilities. While in industrial value chains, the underlying dynamic to increase rent capture is 'upgrading', i.e. the attempt by a value chain actor to 'move up the chain' towards more lucrative segments of the production process, 'upgrading' in (digital) ecosystems seems to imply searching for activities for which the use of one's data set or data analytics capabilities (AI) could prove most lucrative.[126] Rather than 'moving up a given chain', upgrading in the context of (digital) ecosystems means *expanding* it. In fact, once a platform has obtained a significant share of the market in one sector to the extent that it effectively forms a 'bottleneck', such platform may seek to become more integrated into and across other business sectors. As a result of Big Data being the logic of platform businesses, an expansion in user numbers, rather than a focus on 'premium' users, seems to be the preferred trajectory of most digital platforms. Due to Big Data, size allows not only for similar things to be done on a larger scale but also for platforms to engage in activities that would otherwise be inaccessible to them on the basis of them having a smaller data set. Therefore, a 'lifecycle approach' to platforms, which includes phases of growth and the processes of financialisation and consolidation appears as suitable heuristic approach to adopt.

IV. Overcoming Theoretical Biases: A Balanced Analytical Framework for Private Governance in Ecosystems

The strategies deployed by firms controlling digital platforms to achieve and maintain their central position in ecosystems and the many legal and non-legal governance tools necessary for this give a first hint at the centrality of strategic choices in the design of governance—suggesting that governance is 'made' rather than just 'arising' from an unhinged interaction between ecosystem members, as implied by the 'natural order rhetoric'. The use of the GVC approach with its focus on power asymmetry to uncover the value generation and capture process and the way governance influences the distribution of rents among the various actors involved in this process is therefore warranted. Even the business studies literature, which initially focused on how to generate more value, and internalise externalities through the selection of the most appropriate private governance design, has adapted its contribution to fit better the concerns raised by policymakers on the broader social externalities of ecosystems, and the need to design both private as well as public governance regimes that effectively address these concerns[127].

A. Varieties of Governance in Ecosystems: Theoretical Perspectives

[126] P. Evans and A. Gawer, "The Rise of the Platform Enterprise. A Global Survey", (2016) Report of the Centre for Global Enterprise, 17.

[127] See, M.G. Jacobides, C. Cennano & A. Gawer, Externalities and complemetarities in platforms and ecosystems: From structural solutions to endogenous failures, (2024) 53 Research Policy 104906, p.1.

The development of digital platform firms controlling ecosystems to some degree constitutes one of the key characteristics of competition in the digital age.[128] These ecosystems and relations between their various members are quite complex and often link different business actors, who are present in various markets, and interact with different categories of users. Some of these interactions have been theorised as taking place in multi-sided markets, i.e. markets in which the presence of feedback loops between different users and business actors through the operation of non-linear complementarities generates value. These multi-sided markets did not constitute a natural order that pre-existed the emergence of digital platforms. They *emerged* from the building of specific digital platform businesses; they were not linked to a technologically determined outcome (according to the traditional view of economic organisations as having a productive function) or to the nature of the transaction(s) in question (according to the TCE view of the firm). Multi-sidedness thus constitutes an endogenous development, which has caused some authors to note that it is better "to discuss two-sided *strategies* rather than two-sided markets".[129]

If one seriously considers this proposition, one's focus should turn from the 'nature' of the market to the business strategies. Building a successful digital platform business involves various steps. First is selecting the different market sides of the platform that will be active. Second is solving the-chicken-or-the-egg problem, which involves choosing which side of the market will subsidise the other. Third is designing a suitable business model. Fourth is establishing and enforcing the rules of the ecosystem.[130]

Digital platforms do not only compete with each other; they also (sometimes) compete with their complementors. By developing platform rules that regulate their interactions with complementors along with the interactions between complementors themselves, digital platforms can thus *manage* competition. This was traditionally the function of the so-called 'technostructure' inherent in the conglomerate forms of organisation that emerged in the 1960s and expanded into different economic sectors.[131] The difference here is that this control is not exercised over different parts of an integrated company or a longer-term supplier nor is it exercised through labour contracts, rather it is exercised through value chains, comprising of formally independent companies operating in adjacent markets, i.e. 'complements', to the market in which the digital platform or the system integrator holds a pre-eminent position. This form of managed competition within the value chains is not only expressed by contracts but also by non-contractual and technological forms of governance, such as standards and code, peer review, even reputation and feedback systems[132], all these tools enabling some form of control or at least influence.

The use of technical means of coordination has been an important development powered by the digital revolution and the convergence of the telecommunications value chain with that developed for private and/or enterprise computing.[133] From this gradual convergence

[128] See our discussion in Section IV.
[129] M. Rysman, "The Economics of Two-Sided Markets", (2009) 23(3) *Journal of Economic Perspectives*, 125.
[130] M. Cusumano, A. Gawer and D. Yoffie, *The Business of Platforms* (Harper Collins, 2019), 69.
[131] J. Galbraith, *The New Industrial State* (Princeton University Press, 1967).
[132] S. Tadelis, Reputation and Feedback Systems in Online Platform Markets, Annual Review of Economics 2016 8:1, 321-340.
[133] C. Mulligan, *The Communications Industries in the Era of Convergence* (Routledge, 2012).

emerged technical platforms that combine hardware and software along a common architecture, a three-layer model. This model is comprised of: (i) an access network layer, which is currently different between the telecommunications and computing industries, (ii) a core network layer, and (iii) a service layer.[134] As Mulligan explains, the function of the platform "is to hide system complexity from those third parties that wish to use the functionality but do not need to implement it themselves".[135] This is achieved by creating applications on top of an operating system via a set of publicly available interfaces, which are also known as APIs. Such APIs are a set of standalone instructions, routines, protocols and/or tools that have been developed for the purpose of building software applications and indicating the way in which software components should interact in order to perform specific functionalities.

Initially conceived as modules, APIs help developers to reuse sections of code across many different programmes even if said code was initially created for the purpose of resolving one particular problem. This came to prominence after IBM's decision in 1968 to price its software and services separately from its hardware, a form of 'unbundling' of sorts. One of the reasons for which it did this, among many, was to pre-empt competition law enforcement as the company had been under investigation since 1967.[136] This modular approach facilitates the quicker creation of applications by third-party developers and allow them to link together different parts of the system, for example, hardware, peripherals and software.[137] As the architecture of networks becomes more software than hardware-based, the interface definition has also moved from hardware to software and consists of handling 'bits', i.e. small pieces of information.[138] Developers do not need to know the details of the interaction between the hardware and the software as the technical platform handles this on their behalf through the APIs. Vertical connection between nodes on these platforms, which is enabled by APIs, permit the automatic flow of information between the different actors in the value chain.

To the extent that the system relies on 'open' interfaces, the boundaries of these value chains are not delineated by the limits of the organisation or contractual arrangements with suppliers and/or customers, but rather they remain flexible, and the length of the value chain is determined by the degree of the openness of the relevant APIs. Mulligan coins the term 'participatory value chain' to show the way in which open interfaces and open APIs reinforce the role of the end-user consumer while simultaneously transforming digital value chains from being producer-driven to being buyer-driven to the extent that "each time an end-user selects a specific service, they are activating different parts of different value chains".[139]

These interfaces allow the different parts of the platform to operate and produce both demand-side and supply-side economies of scale.[140] In relation to the former, these are beneficial for end-users because compatibility *within* the same platform enables this group to use different applications. Regarding the latter, these result from the need to ensure interoperability *across* different technical platforms. The interfaces that connect different parts

[134] *Ibid*, 22.
[135] *Ibid*.
[136] W. Steinmueller, "The U.S. Software Industry: An Analysis and Interpretive History" in *The International Computer Software Industry* (edited by D. Mowery, Oxford University Press, 1995).
[137] Mulligan, (55), 23.
[138] *Ibid*, 55.
[139] *Ibid*, 26.
[140] *Ibid*, 53.

of a platform may, therefore, be horizontal or vertical.[141] In relation to the horizontal aspect, these allow for the platforms of several different companies to be present in various segments of the industrial structure. Regarding the vertical aspect, this enables connectivity between the service layer and the core networks and can also be used to develop complementary products and services.

Thus, open interfaces could be considered to be substitutes to formal contracting. They offer the figurative 'glue' that holds the digital value chain together as "services built on open APIs essentially function as a string of bargaining relationships between the different actors involved in the service (and any competing service)".[142] Open interfaces are also at the origin of new markets as companies seek to find new and flexible ways through which they dynamically handle the uncertainty of technological change. They seek to do this by sharing small amounts of data between themselves and developers on an ongoing basis without such arrangement being premised upon a contract. By doing this, they can avoid the incurrence of transaction costs. Instead, technology and code are used to establish connectivity between the different components and companies that comprise the platform and between the complementors and the platform itself.[143] As Mulligan explains, APIs "allow for the knowledge contained within different technical systems to become unembedded, [thereby] creating the possibility for many different economic entities to combine and share their data", which means that "knowledge is no longer tied to one digital system".[144] The informal nature of these arrangements may, nevertheless, become a source of power for 'system integrators', such as digital platforms. APIs can coordinate a vast amount of economic activity "outside of the boundaries of the legal entity in terms of ownership",[145] but also outside formal contractual ties. Strategies of control over APIs and interfaces, therefore, provide the foundations of the private governance systems that have emerged to organise the process of value extraction.

The typology framework established by Gereffi, Humphrey and Sturgeon in relation to governance modes in GVCs in essence concerns the relationships between the lead firm and its principal, i.e. its first and/or second-tier suppliers.[146] In this context, 'governance' denotes the bundle of instruments, legal and otherwise, that enable a lead firm to coordinate its value chain. Such tools have, at least, partially overcome the boundaries of privity of contract and have been described as 'contract boundary-spanning' mechanisms.[147] While the emergence of such tools seems intuitive from an institutional economics perspective, governance types can be challenged on various normative grounds. Does a lead firm's governance type provide sufficient leverage for the implementation of sustainability requirements along the chain? Who can challenge the adequacy of a governance regime, the reach of which is beyond a bilateral contract? Who ought to evaluate the effectiveness of a governance regime? How ought such

[141] *Ibid*, 54.
[142] *Ibid*, 26.
[143] *Ibid*, 58.
[144] *Ibid*, 303
[145] *Ibid*, 58.
[146] Gereffi, Humphrey and Sturgeon, (92), 78-104.
[147] J. Salminen, "Contract-Boundary-Spanning Governance Mechanisms: Conceptualizing Fragmented and Globalized Production as Collectively Governed Entities", (2016) 23 *Indiana Journal of Global Legal Studies*, 709-742.

an evaluation be conducted? Is governance design to evade or pre-empt state regulation on the matter at hand?

Consequently, the abovementioned typology cannot be either directly transposed or directly applicable to digital value chains and even less so to ecosystems since it presupposes a segmented linearity of physical production, which would be an inaccurate conception in the face of data-driven business models. In other words, even an ecosystem the locus of which constitutes a strong centralisation of power will not amount to a degree of hierarchical control as envisioned in the 'hierarchy model'. In fact, even the most heterarchical ecosystem will not follow mere 'market' transactions because the infrastructure of the relevant ecosystem infrastructure will require levels of coordination beyond mere spot-relations. Additionally, both the tools and the substantive rules of governance will differ for digital value chains because of their novel incentive and revenue structure, in which customers often pay through their data and, thereby, become part of the value-generating process. Furthermore, the centrality of technology and code offers an additional venue for the implementation of governance by design, such as through the steering power of search algorithms, customer reviews and/or transparency rules regarding transactional data. Ultimately, the stakes of governance become subject to recalibration when digital platforms become gatekeepers for entire industries and/or social practices, such as messaging or online dating. In becoming such, they shift the relevant mechanisms of control from individual clauses through contract law and unfair terms to business and governance models through competition law more broadly.[148]

This makes it even more crucial for governance not to be identified by formal legal rules alone; rather, it needs to be thought of as the interplay between positive rules (of varying degrees of formality) and spaces of 'ungovernance'[149], i.e. spaces which appeal to and incentivise actors in an ecosystem who might otherwise be insensitive to strict governance rules. Generally speaking, three levels of governance can be distinguished. First is 'contractual' governance – this manifests itself in specific clauses, such as those concerning exclusivity, royalties or termination. Second is 'soft and informal' governance, which includes aspects of community-building, standards of behaviour, perks and reputational governance. Third is 'technological' governance, which is imposed through the technical interface of the platform and is implemented, for example, through the control of APIs, algorithms, patents, etc.

Overall, we propopose a typology for ecosystem governance, inspired by Gereffi, Humphrey and Sturgeon, that is premised on a continuum ranging from 'participatory/ collaborative' on one end, with 'relational governance' in the middle, to 'captive/ intrusive' governance by the orchestrator on the other end. The types of governance present on the continuum will differ with respect to the following crucial features. Firstly, the entry and exit barriers of the ecosystem, such as performance standards, community-oriented regulation/ lock-in effect, switching costs. Secondly, the degree of transparency of the relevant governance instruments and conditions. Thirdly, the degrees of formality and co-operation inherent in the relevant governance instruments and conditions and the degree to which such appeal to extra-legal norms, such as trust and reputation. Fourthly, the ease of customising the governance

[148] See T. Höppner, P. Westerhoff and J. Weber, "Taking a Bite at the Apple: Ensuring a Level-Playing-Field for Competition on App Stores", (2019), Paper <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3394773>.
[149] See D. Desai & A. Lang, Introduction: Global Un-Governance, (2020) 11 Transnational Legal Theory 219.

model and the platform use, fifthly the price model, and sixthly the functionality of dispute mechanisms.

Table 2: Ecosystem Governance Types

	Feature					
	Entry/ Exit Barriers	Transparency	Formality, Co-operation and Appeal	Customisation	Price Model	Dispute Mechanism Functionality
Participatory/ Collaborative Governance	Low	Transparent	Informal	Low	Finance	Learning
	↓	↓	↓	↓	↓	↓
Relational Governance	High	Opaque	Formal	High	Data	Deterrence
Captive/ Intrusive governance						

This typology should be tested against a series of private governance tools elaborated by different platforms from different business sectors. The guiding question is to understand how the governance regime of an ecosystem, whether it be contractual, soft and informal, or technological, emerges, as a way to internalise externalities, and to ensure the coordination of the value chain. Such coordination is the core function of private governance (even though there may well be problems that private governance may not solve). Importantly, 'private' does not imply total isolation from the reach of public regulation and governance—oftentimes, private governance develops to react to, complement, pre-empt, or evade public rules.

B. Private Governance Tools in Digital Ecosystems: Empirical Perspectives

We will now turn to testing this typology via a select set of case studies of ecosystems in different sectors. We conduct an in-depth examination of governance regimes in ecosystems that operate in different key jurisdictions, are at different levels of ecosystem growth and arise from different core business sectors. Despite the wide array of sectors in which platforms and ecosystems are active, there are significant similarities that emerge and constitute patterns of governance.

Firstly, it should be noted that the factors of size, experience and the nature of establishment can impact greatly upon the governance regime. Typically, start-ups will follow a more participatory and/or collaborative scheme, whereas global market leaders will deploy their enhanced bargaining power through more captive and/or intrusive governance models. Hence, it is essential to include a genealogical element of platform growth into the analysis in order to be able to engage with business strategy changes, such as in pricing models, that occur

across phases of growth. This gap is even bigger between platforms, which are genuinely digital from the start, and incumbent firms in the manufacturing and asset economy, which are increasingly seeking to include platform elements in order to develop their business model.

Secondly, it is worthwhile distinguishing between (i) relationships between the platform and businesses (henceforth, 'P2B'), which form part of their ecosystem and (ii) relationships between the platform and their customers and/or consumers (henceforth, 'P2C'). Both sets of relationships are ruled by an assembly of codified, formal, and informal rules and practices as well as technological infrastructure. Yet, they centre around different legal issues. While P2B relations face little regulatory constraint outside of competition law, P2C relations are subject to greater levels of scrutiny by consumer law, data protection and privacy law.

1. Patterns of Governance in P2B Relations

(a) Translating Business Models into Governance Patterns

All the case studies on P2B relations pertain to platforms that constitute key platform(s) for their respective ecosystem(s). The Ts&Cs of service of these platforms illustrate and drive a technology-based, digital network that ensures a steady supply of platforms with infrastructure, data and clients that are not controlled by corporate ownership or subject to hierarchical steering. Private governance regimes are designed to enable agility in terms of business models. They do this by placing the burden of investment in specialisation in classical business sectors on the platform's contractors, for example, for Airbnb, the burden is placed on the hosts, for Google Marketplace it is on the sellers, for Uber it is on the drivers and for Android it is on the developers etc. At the same time, these private governance regimes allow the platform to undertake cross-sectoral investments that collectively form an ecosystem.[150]

The contractual governance regimes of P2B relations display three key features. Firstly, they create loyalty to the platform and consolidate it as a privileged channel for the marketisation of the relevant goods and services. As such, terms impose entry barriers because they require price party (sometimes even exclusivity), they request that the business aligns its presentation style with that of of the platform business, require the business provide the platform with the right to use IP protected material of the business,[151] and may impose the subscription to further, but not necessarily related, services by the platform, which is known as 'bundling'. Each of these features is reinforced in the technological design of the relevant platform.

Secondly, they implement dispute resolution mechanisms that are complex and non-transparent, which can serve to foster the non-legal and/or soft incentives of the parties. For legal claims, arbitration clauses and a waiver of class actions are common. Pre-legal claims are often handled in accordance with internal dispute proceedings that may lack fundamental

[150] F. Glatz, "Modes of Contractual Governance in an On-Demand Service Economy", (*medium.com*, 4 May 2015), <https://medium.com/@heckerhut/modes-of-contractual-governance-in-an-on-demand-service-economy-1833629f379b>.

[151] Yelp, "Terms of Service", (last accessed 7 May 2024), available at <https://www.yelp.com/static?p=tos>, Section 5B: "We may use Your Content in a number of different ways, including by publicly displaying it, reformatting it, incorporating it into advertisements and other works, creating derivative works from it, promoting it, distributing it, and allowing others to do the same in connection with their own websites and media platforms".

principles related to the rule of law, such as the provision of grounds or transparency etc. This can especially be so given the existential stakes for small businesses, as illustrated in the Amazon Marketplace suspension appeal procedure.[152]

Thirdly, in the context of the business relationship, they may give the platform broad discretion over governance and business development opportunities,[153] while simultaneously creating high lock-in costs and little inter-platform mobility and data transmissibility for businesses.[154] For example, they may enable the platform to unilaterally adjust terms,[155] such as pricing, and to terminate the relationship.[156]

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[152] See Eller in Lianos/Ivanov, BRICS Competition Report 2019, p. 1173 et seqq.

[153] Airbnb Terms of Service for European Users (last accessed 7 May 2024), available at https://www.airbnb.com/help/article/2908?_set_bev_on_new_domain=1640537012_MDMyNTI1OWRlMTFk&locale=en#EUTOS Section 17: "Airbnb (…) has the right to review, disable access to, remove, or edit Content to: (i) operate, secure and improve the Airbnb Platform (including for fraud prevention, risk assessment, investigation and customer support purposes); (ii) ensure Members' compliance with these Terms; (iii) comply with applicable law or the order or requirement of a court, law enforcement or other administrative agency or governmental body; (iv) address Member Content that we determine is harmful or objectionable; (v) take actions set out in these Terms; and (vi) maintain and enforce any quality or eligibility criteria, including by removing Listings that don't meet quality and eligibility criteria (…).".

[154] See confidentiality clauses, such as in the Apple Developer Program License Agreement, available at https://developer.apple.com/terms/ (last accessed 7 May 2024), Section 9.1: "You agree that all pre-release versions of the Apple Software and Apple Services (including pre-release Documentation), pre-release versions of Apple hardware andthe FPS Deployment Package will be deemed "Apple Confidential Information")". Another one can be found in the Amazon Developer Service Agreement (last accessed 7 May 2024), available at https://developer.amazon.com/de/support/legal/da, Section 12: "You will: (a) protect and not disclose information made available by us that is identified as confidential or that reasonably should be considered confidential; (b) use that information only to fulfill your obligations or exercise your rights under this Agreement; and (c) either destroy or return all such information to us promptly when the Agreement terminates (and, upon request, confirm such destruction in writing). This paragraph covers all confidential information regardless of when you receive it.".

[155] See Airbnb Terms of Service for Non-European Users (last accessed 7 May 2024), available at https://www.airbnb.com/help/article/2908?_set_bev_on_new_domain=1640537012_MDMyNTI1OWRlMTFk&locale=en#EUTOS, Section 13: "Airbnb may modify these Terms at any time. When we make material changes to these Terms, we will post the revised Terms on the Airbnb Platform and update the "Last Updated" date at the top of these Terms. We will also provide you with notice of any material changes by email, notifications through the Airbnb Platform, messaging service, or any other contact method made available by us and selected by you at least 30 days before the date they become effective. If you disagree with the revised Terms, you may terminate this agreement immediately as provided in these Terms. If you do not terminate your agreement before the date the revised Terms become effective, your continued access to or use of the Airbnb Platform will constitute acceptance of the revised Terms."; Apple Developer Program License Agreement last accessed 7 May 2024), available at https://developer.apple.com/terms/Section 4: "Apple may change the Program Requirements or the terms of this Agreement at any time.".

[156] Amazon Developer Service Agreement (last accessed 7 May 2024), available at https://developer.amazon.com/de/support/legal/da, Section 9: "We may also suspend or terminate this Agreement and your Program account (including access to your Program account) at any time at our discretion with effect 30 days after we notify you, unless we specify a later effective date."; Alibaba Cloud International Website Terms of Use (last accessed 7 May 2024), available at https://www.alibabacloud.com/help/faq-detail/42417.htm, Section 4: "Alibaba Cloud shall have the right at its sole and absolute discretion to remove, modify or reject any content that you submit to, post or display on the Alibaba Cloud Platform which in our sole opinion is unlawful, violates the Terms, or could subject Alibaba Cloud or our affiliates to liability"; Airbnb Terms of Service for European Users (last accessed 7 May 2024, available at https://www.airbnb.com/help/article/2908?_set_bev_on_new_domain=1640537012_MDMyNTI1OWRlMTFk&locale=en#EUTOS Section 13.3: "If (i) you breach these Terms, our Additional Legal Terms, Policies, or our Standards, (ii) you violate applicable laws, regulations or third party rights, (iii) you have repeatedly received poor Reviews or Airbnb otherwise becomes aware of or has received complaints about your performance or conduct, (vi) you have repeatedly cancelled confirmed bookings or failed to respond to booking requests without a valid

(b) Interplay between Contractual, Soft and Technological Layers of Governance

The formal contractual layer is the most significant in P2B relations. It ensures the stability of the supply relationship. Soft and technological governance fulfil a complementary role, especially when contractual terms are vague or not transparent, whether that be deliberate or not.[157]

A good illustration of soft governance in the use and potential abuse of a gatekeeper position in an ecosystem is provided by Google's policy towards third-party content providers. Many of them make money from advertising on their websites and are, thus, dependent on the indirect traffic that is generated by referrals from either Google's general or specialised search services. Google uses this dependency to encourage agreements that improve their search results and, thus, raise advertising revenue. An example of this can be seen in Google's 'first click free' policy. It obligated online news providers to make paid articles available for free when they were accessed over Google Search, else such articles would be removed from the search results.[158] Even though Google has given up on this policy, it now offers a centralised subscription service called 'subscribe with Google'.[159] This service rewards participating publishers with higher ranks in the search results of users that have subscribed to that specific service.[160] Two general lessons can be drawn from this example. First, it demonstrates how Google uses the economic dependency of businesses to make them enter into agreements that are beneficial for Google, either by the use of threats as can be seen in the case of the 'first click free' policy, or by the use of rewards as in the case of 'subscribe with Google'. Second, it shows that Google has a strong interest in keeping content available through search, as this provides Google with the advertising advantages of a content provider, without bearing the risk of actually providing the content itself.

Technological governance can occur as algorithmic governance in regard to the structuring of listings, the suggestion of price-levels and the design of the communicative space between businesses and their users.

Another central role of technological governance lies in the definition of standardised parameters, which enable the interoperability of the different modules of the ecosystem (APIs). While such technological governance is essential to allow for the complementarity of the modules (and therefore the core value proposition of ecosystems), it is often unilaterally created and enforced by undertakings that control the central (often indispensable) platform in an

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reason, or (vii) such action is necessary to protect the personal safety or property of Airbnb, its Members, or third parties, Airbnb may: suspend or limit your access to or use of the Airbnb Platform and/or your account;".

[157] Australian Competition and Consumer Commission (henceforth 'ACCC'), "Digital Platforms Inquiry", (2019), Final Report, 418-420.

[158] G. Ruddick, "Google to Ditch Controversial 'First Click Free' Policy", (*theguardian.com*, 2 October 2017), <https://www.theguardian.com/technology/2017/oct/02/google-to-ditch-controversial-first-click-free-policy>.

[159] J. Albrecht, "Introducing Subscribe with Google", (*blog.google*, 20 March 2018), <https://www.blog.google/outreach-initiatives/google-news-initiative/introducing-subscribe-google/>.

[160] G. Marvin, "Google News Initiative Kicks Off with Subscribe with Google", (*searchengineland.com*, 21 March 2018) <https://searchengineland.com/google-news-initiative-kicks-off-subscribe-google-efforts-294624>.

ecosystem.[161] These actors are therefore able to restrict the functioning of third-party products and services through the imposition of certain technological restrictions, hereby favouring their own offerings.[162] This shows the ambivalent nature of (technological) governance in ecosystems: It is on the one hand essential for the functioning of the ecosystem, but it is always at risk of being captured and abused by undertakings that control central infrastructure in the ecosystem.

(c) Relevant Terms: Data Transferability, Price-Setting, Suspension of Service/ Membership

The most highly disputed Ts&Cs between platforms and businesses concern: entry/exit barriers stemming from data transferability, the protection of distribution channels, price-setting and remuneration, and, ultimately, the suspension of service.

A particularly illustrative case in regard to the protection of distribution channels is provided by Google Play. Android developers that offer their applications through Google Play are charged a transaction fee of 15-30% for app and in-app product sales.[163] No transaction fee will be charged when applications are offered for free but developers are obliged to keep products available for free when they have initially been offered for free.[164] Google tries to bind developers to the Play Store by providing them with development tools that are only made available to them under the condition that they will not be used for the development of applications for other platforms, including non-compatible implementations of Android.[165] This prevents developers from multi-homing, from offering their app in several app stores, such as the Amazon and/or Apple app store. Furthermore, Google explicitly prohibits the distribution of "any Product that has a purpose that facilitates the distribution of software applications and games for use on Android devices outside of Google Play".[166]

These governance patterns therefore show a similar structure as the technological governance structures described above: On the one hand there is a necessity for the definition of standards and rules on membership and participation on the ecosystem. This is due to the fact that the different actors in the ecosystem depend on each other in their joint value creation, which requires some sort of selection to ensure that the members are delivering a valuable

[161] Final Report from the Commission - sector inquiry into consumer Internet of Things (2022), p. 9 et seq., available here: https://competition-policy.ec.europa.eu/system/files/2022-01/internet-of-things_final_report_2022_en.pdf.
[162] Final Report from the Commission - sector inquiry into consumer Internet of Things (2022), p. 9 et seq., available here: https://competition-policy.ec.europa.eu/system/files/2022-01/internet-of-things_final_report_2022_en.pdf
163 Google Play, "Google Play Developer Distribution Agreement"(last accessed 7 May 2024), available at https://play.google.com/about/developer-distribution-agreement.html, Section 3.4.
164 Google Play, "Google Play Developer Distribution Agreement", (last accessed 7 May 2024, available at https://play.google.com/about/developer-distribution-agreement.html, Section 3.7.
165 Android Software Development Kit License Agreement Android (last accessed 7 May 2024), available at https://developer.android.com/studio/terms, Section 3.2.
166 Google Play, "Google Play Developer Distribution Agreement" (last accessed 7 May 2024), available at https://play.google.com/about/developer-distribution-agreement.html, Section 4.5.

input. On the other hand, the standards are often set and controlled by a dominant actor in the ecosystem, which creates much potential for abuse.[167]

2. Patterns of Governance in P2C Relations

(a) Translating Business Models into Governance Patterns

In platform-to-consumer or P2C relationships, contractual governance serves the purpose of community-building. It consolidates consumer loyalty and enables the extraction of value from repeated transactions and activities both on and off the platform, which can generate a data set that platforms aim to merge. The purpose of community-building occurs to a large extent through social norms, default rules and incentives that are implemented through technology, such as through a membership platform, ratings and/or discounts for returning customers. As for privacy policies, the issue concerning the combination of data that may be collected through third-party accounts is crucial since it allows for a much more substantive data set than that which the platform would have had if the data were solely based on internal data. Cross-platform mergers of data take place through the linking of accounts on one platform with accounts on another, such as connecting a Facebook user page with one's Airbnb account, or through social plugins, such as the 'Like' button. In its decision on Facebook, the German Competition Authority, the Bundeskartellamt, prohibited Facebook's practice of subjecting access to its services to the agreement that user data through other Facebook-owned apps and services would be aggregated.[168]

In addition to this, contractual governance generally implements far-reaching privacy rules,[169] while also being complaisant in relation to other aspects of the consumer experience, such as lenient cancellation rules, the right to withdraw from contracts, the right to return purchased items etc. When compared to the offline consumer experience, contractual governance produces a consumer-friendly impression that serves to distract from tight privacy policies that are much more economically significant for platforms' business models. Bigger platforms, in particular, generate high levels of trust while simultaneously discarding consumer concerns regarding a lack of liability and/or discriminatory pricing through extensive insurance guarantees, such as with Airbnb and Uber, and special offers.

(b) Interplay between Contractual, Soft and Technological Layers of Governance

To translate P2C business models into governance patterns, formal contractual rules are not sufficient. Rather, platforms use contractual, soft and technological governance forms for very distinctive purposes. The contractual level of governance is used to ensure the provision

[167] Final Report from the Commission - sector inquiry into consumer Internet of Things (2022), p. 9 et seq., available here: https://competition-policy.ec.europa.eu/system/files/2022-01/internet-of-things_final_report_2022_en.pdf

[168] German Competition and Markets Authority ('Bundeskartellamt'), "Facebook, Exploitative Business Terms pursuant to Section 19(1) GWB for Inadequate Data Processing", Decision of 6 February 2019, B6-22/16, <https://www.bundeskartellamt.de/SharedDocs/Entscheidung/EN/Fallberichte/Missbrauchsaufsicht/2019/B6-22-16.pdf?__blob=publicationFile&v=4>.

[169] For a compelling comparison across platforms, see ACCC, (138), 380 et seqq.

of data and the limitation of business risks by limiting liability. Consumers are given little opportunity to customise or opt-out of data protection and usage rules.[170] However, the incentives for consumers to join and, more importantly, actively use the platform are set through soft and technological tools. In this context, soft governance includes the social benefits of joining services that follow a network logic, i.e. community-building. It enables for instance the exchange of information with peers or gives access to peer recommendations. Other forms of soft governance may involve the provision of rewards for extensive usage, such as enhanced user status or discounts, or accommodating rules, or targeted publicity.

A particular illustration of informal governance is the bond created by social media, notably Facebook. Its anchor in users' habits make membership of the platform extremely difficult to break. As such, the type of power that online platforms exercise vis-à-vis users is less one of market share or 'government-like' size but, rather, it has correctly been described as 'subtle Foucauldian modes' of power that are grounded in and modify the very routines and practices of individuals' lives.[171]

In P2B relations, technological governance is used for the purpose of standardising user communication and behaviour, in particular to prevent users from leaving or circumventing the platform, and to structure and rank the offers and/or listings that are displayed to a user.

(c) Relevant Terms: Legal Qualification of the Agreement, Liability and Privacy

In the Ts&Cs between platforms and users, three areas are key for the platform: (i) the determination of its own legal role and, thus, the legal qualification of the agreement, (ii) liability, and (iii) the rules on privacy and data exploitation.

Platforms seek to shield themselves from liability from both consumers and businesses through various mechanisms. One is the employment of limitation of liability clauses. Another is to provide only matchmaking services without being party to the agreement concluded between the platform and the consumer, let alone influencing its substance.[172]

Accordingly, platforms will use careful wording to assert that the main performance of the platform involves matchmaking, rather than the provision of a substantial service. However, the impression given to consumers regarding the platform contrasts greatly with the restriction of liability and the alleviation of the accurateness of the information, ratings etc. For instance, Airbnb denies any responsibility for the quality of its listings, the information and photographs provided and/or its hosts, even if they are presented as 'verified'.[173] Yet, at the same time, the

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[170] *Ibid*, 427-433.

[171] A. Papazglou, "Facebook is a New Form of Power", (*newrepublic.com*, 22 July 2019), <https://newrepublic.com/article/154504/facebook-new-form-power?utm_content=buffer2c632&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer>.

[172] Airbnb Terms of Service for European Users (last accessed 7 May 2024), available at https://www.airbnb.com/help/article/2908?_set_bev_on_new_domain=1640537012_MDMyNTI1OWRlMTFk&locale=en#EUTOS, Introduction: "As the provider of the Airbnb Platform, Airbnb does not own, control, offer or manage any Listings, Host Services, or tourism services. Airbnb is not a party to the contracts entered into directly between Hosts and Guests, nor is Airbnb a real estate broker, travel agency, insurer or an organiser or retailer of travel packages under Directive (EU) 2015/2302. Airbnb is not acting as an agent in any capacity for any Member, except as specified in the Payments Terms of Service ("Payment Terms")."

[173] Airbnb Terms of Service for European Users (last accessed 7 May 2024), available at https://www.airbnb.com/help/article/2908?_set_bev_on_new_domain=1640537012_MDMyNTI1OWRlMTFk&

matching of strangers (customers and hosts) for private home rentals hinges largely upon Airbnb's role as a trust broker. The social expectations created by Airbnb vis-à-vis its own role and its ascription as an intermediary are far more substantial than those reflected in its Ts&Cs of Service.

As regards privacy, platforms collect both personalised and non-personalised data. Personalised data is handled with greater caution and restriction, yet, the definition of 'personalised data' varies from platform to platform.[174] A particular matter of concern is the combination of data sets, as powerfully illustrated by the Data Policies of Google[175] and Facebook[176]. Pursuant to its recent merger strategy, Facebook counts among its services today major web services like WhatsApp, Instagram, Facebook Analytics and Ad Reporting. In addition, Facebook collects user data through the 'Facebook Login' and 'Account Kit', both of which are widely-used tools that enable individuals to login on third-party websites and apps. Through such, Facebook receives information from third-party websites and services, namely the websites and apps with which a Facebook user is registered and uses. As a result, Facebook is able to collect a broad set of data relating to individual users' accounts.[177]

V. Towards a Public Governance Turn in Digital Ecosystems

One of the major concerns that drives the emergence of public governance mechanisms in recent years, after a period of 'silence of the law'[178] that largely embraced and left unchecked private governance arrangements, is the rise of a centralised economic and technological structure with the development of powerful Big Tech companies. Although the effort to regulate the digital space has been scattered in various regimes of public governance and undertaken at different moments, it is clear that the main concern these efforts attempt to address is the multi-dimensional power capabilities enjoyed by the large "Big tech" actors in the digital economy. These recent efforts attempt to de-bias the law from the 'natural order rhetoric' and bring a more balanced approach, addressing heads on the externalities produced by (digital) ecosystems. Regimes of public governance act as a complement to private governance tools when these do not adequately integrate broader public values, often not related to a profit motive, or do not sufficiently consider the interests of underrepresented categories of stakeholders, which, as mentioned earlier, are not usually included in the private governance of ecosystems, to the extent that the dominant logic remains shareholder value maximisation.

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locale=en#EUTOS, Section 19: "We do not endorse or warrant the existence, conduct, performance, safety, quality, legality or suitability of any Guest, Host, Host Service, Listing or third party and we do not warrant that verification, identity or background checks conducted on Members (if any) will identify past misconduct or prevent future misconduct. Any references to a Member being "verified" (or similar language) indicate only that the Member or Airbnb has completed a relevant verification or identification process and nothing else."

[174] ACCC, (138), 409-410.

[175] Google's Privacy Policy (last accessed on 7 May 2024), available at https://policies.google.com/privacy?hl=en. Section "Why Google Collects Data", Subsection "Protect Google, our users, and the public".

[176] Meta's Data Policy, (last accessed on 7 May 2024), available at https://www.facebook.com/privacy/policy/, Section "How do we use your information".

[177] Bundeskartellamt, (146), paragraphs 68-150.

[178] I. Lianos, Value extraction and institutions in digital capitalism: Towards a law and political economy synthesis for competition law. *European Law Open*. 2022;1(4):852-890. doi:10.1017/elo.2023.2 .

A. Beyond the 'Natural Order Rhetoric': An Institutional Perspective

The focus on governance regimes, inherent in the GVC perspective, raises the important question of the role of the legal system and institutions of public governance more generally in explaining but also in structuring the development of digital value chains and business ecosystems. However, focusing on legal institutionalism provides part of the picture as coordination in the context of business ecosystems may result not only from law but also from technical agencements (code). Acknowledging this broader dimension is key in order to understand the limits of traditional legal institutions, such as contract, civil liability or property law, put in place in order to deal with problems and externalities in private orderings, to integrate broader public values.

1. The Power and Limits of Contractual Governance – Legal Institutionalism

In relation to digital platforms, market dynamics and characteristics can no longer be regarded as stable, pre-existent and an emanation of a natural order, linked to economic autonomy and bilateral exchange, as these were traditionally conceived of in the bricks-and-mortar economy. Legal institutionalists have explained how certain institutions constitute critical and central characteristics of the development of capitalism, highlighting the role of law in the establishment and maintenance of markets, firms and other forms of economic organisation.[179] Resisting technological determinism, legal institutionalists link the emergence of technological innovations to the emergence of legal institutions or "code", such as property rights, contracts, finance and other legal parameters[180]. Unlike Williamson,[181] who—drawing on Coase[182]—established the role of law in building economic institutions but perceived law as a tool of public governance and private ordering, essentially serving efficiency between firms and markets, legal institutionalists claim to have a more holistic understanding of the legal system. First, while taking private ordering in its current pervasiveness and also practical appeal serious, legal institutionalists reflect on the power structure involved in private ordering.[183] Second, legal rules are evaluated not solely in regard to their level of influence on rational individuals but on their institutional effects, namely those effects that, under realistic assumptions, arise from the aggregate use of the particular rights and entitlements conferred by the relevant legal rule.

A central tenet of this approach is to conceive of the legal status quo as one out of many possibilities of legal design, its realisation being to some extent path-dependent. When confronted with novel social or economic phenomena, the current emanation of these approaches needs to be thought of as a legal construct that is potentially amendable by legal

[179] S. Deakin, D. Gindis, G. Hodgson, H. Kainan and K. Pistor, "Legal Institutionalism: Capitalism and the Constitutive Role of Law", (2017) 45 *Journal of Comparative Economics*, 188-200.
[180] K. Pistor, *The Code of Capital: How the Law Creates Wealth and Inequality* (Princeton Univ. press, 2019).
[181] See R. Coase, "The Nature of the Firm", (1937) 4 *Economica*, 386-405; R. Coase, *The Firm, the Market, and the Law* (University of Chicago Press, 1988).
[182] O. Williamson, "The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting", (1985), University of Illinois.
[183] Deakin et al., (70), 189 et seqq.

means. For example, with regard to the governance of global value chains, the Research Manifesto of the IGLP Working Group has argued that "law is more than an 'external' or 'contextual' factor shaping the strategic decision-making of firms 'inside' GVCs. Rather, … law resides at the heart of the GVC phenomenon—it is the vehicle through which value is generated, captured and distributed within and between organisational and jurisdictional domains, and diverse and geographically disparate business operations are co-ordinated and governed".[184]

The contractual relations within a given ecosystem depend on its functionality. Take the example of a matchmaking platform, such as Amazon in regard to retail, Airbnb in regard to short-term rentals, or Tinder in regard to dating. Both the 'supplier' and the 'client' in the former two platforms, or in the case of Tinder both users, are bound to the platform by its standard contract terms, i.e. its boilerplate clauses. Those terms stipulate the rights and duties of the platform and the respective participant, formulate standards of behaviour for the entire community, and set out ways of exiting from the platform and deleting one's account, and the imposition of sanctions. With the platform itself being a party to these contracts, they (the platforms) establish the technological and social infrastructure required to enact the business plan, i.e. its 'vision', on a 'take-it-or-leave-it' basis. What appears as community standards is *de facto* established through the central regulatory capacity of the platform.[185] The more 'community-life' a platform can generate, the higher its consumers' loyalty and the platform's own data set (whether such is measured/collected through reviews, social tracking, usage rates etc.) will be, which can become a source of future profitability.

The contract concluded between the supplier and the client is generally largely regulated or co-regulated by the platform.[186] Both the supplier and the client are provided with a fully-fledged regulatory framework upon which their transaction is based. This framework will consist of primary rules, rules of interpretation and, often, rules regarding dispute resolution. Typically, these rules serve as default rules and, to some extent, can be customised—though not always. This possibility of customisation arguably entails a risk that the platform in its dominant position may seek to abuse such as it can steer, either through binding rules or through the effects of defaults, the contracting member's behaviour. This can be done, for example, through beneficial pricing or an allocation of risks that primarily serves the platform, which is to attract more members on either the demand or supply side.

One reason that the role of contractual governance is crucial is because classical points of intervention under national legislation are not effective with regard to online platforms, because, for example, platforms may and/or have tried to circumvent guarantees espoused by labour law, such as with Uber, or tax law, such as with Airbnb. The significance of private governance in relation to online platforms has been endorsed by the European Commission and such position seems unlikely to change very soon. In its Communication on Online Platforms, the Commission stated that "principle-based, self- or co-regulatory measures, including industry tools for ensuring the application of legal requirements and appropriate monitoring

[184] IGLP Law, (32), 60-61.
[185] M. Grochowski, "Spontaneous Order in the Sharing Economy? A Research Agenda|, (2018) 49 *Zeszyt*, 75 et seqq.
[186] *Ibid*, 75 et seqq.

mechanisms can play a role" in the future regulatory framework.[187] While the majority of rules within terms & conditions (henceforth, 'Ts&Cs') are global in their reach, it has become common to add specific terms that reflect the relevant national regulatory environment, its case-law and its rules on unconscionability.[188]

The mechanisms of legal control of private governance depend upon the nature of the rules. In business-to-consumer (henceforth, 'B2C') contracts, the EU and other jurisdictions review clauses under a criterion of fairness and many jurisdictions have sectoral rules concerning privacy protection. For business-to-business (henceforth, 'B2B') contracts however, only very limited reasons for unconscionability exist, though, there is an ever-increasing number of similarities between the types of clauses used by platforms, which have been perceived to be unfair by other actors in the ecosystem. A survey conducted by the European Commission found that in B2B relationships, contract clauses from standard Ts&Cs were deemed problematic by businesses on several bases.[189] Firstly, Ts&Cs, often, cannot be negotiated. Secondly, platforms often reserve the right to unilaterally change their Ts&Cs. Thirdly, clauses typically require a 'bundling' of subscriptions to various services of the platform, including auxiliary services, and may prescribe proprietary payment systems, data clouds and/or communication channels. Fourthly, platforms, such as travel agencies or hotel booking sites, use 'parity clauses', which impose a price at least as low as that offered through other distribution channels. Lastly, rules may restrict access to and/or the use of data, which, in turn, may hinder one's ability to switch platforms. Cross-cutting issues were unclear termination, suspension conditions and procedures (as illustrated by the case-study on Amazon), and the general complexity and vague nature of Ts&Cs.

Given the recurrence of typical clauses across platforms, recent initiatives to formulate model clauses for digital platforms may have promising potential. These include the European Law Institute's 'Discussion Draft of a Directive on Online Intermediary Platforms',[190] as well as the EU Regulation that promotes fairness and transparency for the businesses using online intermediation services (henceforth, the 'P2B Regulation').[191] Importantly, model clauses will typically, although not necessarily, be limited to a formal, contractual level of governance and will leave the more informal, social and technological levels unaffected. This provides a strong argument in favour of mobilising other more hands-on tools of public governnce, such as competition law and its particular sensitivity towards diverse emanations of economic power concerning digital platforms alongside the more conventional and long-standing instances of contract law and consumer protection.

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[187] EU Commission, "Communication on Online Platforms and the Digital Single Market Opportunities and Challenges for Europe", (2016), Communication COM(2016)288, <https://ec.europa.eu/digital-single-market/en/news/communication-online-platforms-and-digital-single-market-opportunities-and-challenges-europe>.

[188] In the EU, limitation of liability clauses are subject to unfair terms control, see, for example, the Airbnb, Terms of Service for European Users, Section 17 .

[189] European Commission, "Business-to-Business Relationships in the Online Platforms Environment – Legal Aspects and Clarity of Terms and Conditions of Online Platforms", (2016), Engagement Workshop Report.

[190] Research Group on the Law of Digital Services, "Discussion Draft of a Directive on Online Intermediary Platforms", (2016), European Legal Studies Institute, EuCML 4/2016, <https://www.elsi.uni-osnabrueck.de/projekte/model_rules_on_online_intermediary_platforms/discussion_draft.html>.

[191] Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services. [2019] OJ L 186/57.

2. Institutional Automation under Big Data: The 'Uncontract'

The added value of such more flexible tools of public governance may also be understood by the broader set of governance tools that may be implemented in regulating modern (digital) business ecosystems. Theories and practices of contract governance have thus far relied on their ability to govern other individuals and/or entities being premised on mechanisms of control, incentives, sanctions and rewards. Contracts, and even more so the contractual regime that binds contract together, serve to reduce uncertainty about the future behaviour of others, by formulating expected obligatory (from a legal perspective) standards of behaviour coupled with various enforcement mechanisms.

Novel, information technology-based forms of interaction, such as, for instance, blockchain, challenge however this view of contracting. In such forms, the personal dimension of interaction is increasingly supplanted by technology, which allows for the prediction of others' behaviour to be done on the basis of data, rather than 'contract' rules, and such can be 'enforced' automatically by technological means. Take, for instance, the 'enforcement' of a decision by the dispute body of the International Corporation for Assigned Names and Numbers (henceforth, 'ICANN'), the Uniform Domain-Name Dispute-Resolution Policy (henceforth, the 'UDRP'), which involved the deletion of a domain or the real-time adjustment of car insurance premiums based on the insurance holder's driving style.[192] Zuboff has termed these phenomena that subvert the essence of contracting to be an 'uncontract', rather than some new form of contracting.[193] As she describes it "the uncontract is not a space of contractual relations but rather a unilateral execution that makes those relations unnecessary. The uncontract de-socialises the contract, manufacturing certainty through the substitution of automated procedures for promises, dialogue, shared meaning, problem solving, dispute resolution, and trust: the expressions of solidarity and human agency that have been gradually institutionalised in the notion of 'contract' over the course of millennia. The uncontract bypasses all that social work in favour of compulsion, and it does so for the sake of more-lucrative prediction products that approximate observation and therefore guarantee outcomes".[194]

Hence, the bilateralism of contracts, which had arguably already become a fiction in many instances, although it still underpins the theories and doctrines of contract, ultimately loses all its ground. Instead of a however fictitious 'meeting of the minds', neither 'minds' nor their 'meeting' seems necessary in case of 'uncontracts'. Uncontracts are "unprecedented in their ability to impose unilateral power" on the basis of technological or economic dependence.[195] In other words, contractual governance needs to reflect not only the whole lifecycle of contracts, which has become subject to digitalisation,[196] but that basic elements of

[192] International Corporation for Assigned Names and Numbers ('ICANN'), "Home Page", (*icann.org*), <https://www.icann.org>.
[193] S. Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the Frontier of New Power* (Profile Books, 2019), 208 et seqq.
[194] *Ibid*, [page].
[195] *Ibid*, 314.
[196] S. Grundmann and P. Hacker, "Digital Technology as a Challenge to European Contract Law – From the Existing to the Future Architecture", (2017) 13 *European Review of Contract Law*, 255-293.

contracts have been absorbed into technological mechanisms of compliance, algorithmic governance and/or governance by design. Further examples can be drawn from the broad field of smart contracts that are emerging, for example, 'lex cryptographia'.[197]

Such practices for the most part fly under the radar of control of contract and consumer protection law. 'Uncontracts' are not parts of Ts&Cs that can be easily isolated and struck down as in a blue-pencil-test, rather they (i) become integral parts of the platform service itself, and (ii) they no longer present themselves as identifiable contractual devices. Instead of subjecting each and every one of these 'uncontracts' to scrutiny, regulatory responses need to address them on a more abstract and overarching level. In light of this, public governance, most notably through competition law, needs to determine permissible practices, while standards of rule of law can establish procedural guarantees vis-à-vis technological processes. The current updating of competition law for the digital era illustrates that perceptions of technology as 'lawless spaces', as was misleadingly assumed in the early days of the Internet, have been overcome. When placed within a broader, inclusive agenda, competition law or regulation can formulate transnational 'constitutional' rules for digital platforms and markets, thereby, subjecting them to the rule of law.

Such meta-level approaches can ultimately also be embedded in the private governance of platforms themselves and, thereby, add a self-reflexive element to their operations. One can think of combinations between substantive rules and instruments, (for example, ethics codes in venture capital), procedural rules and instruments (for example, platform-related dispute mechanisms) and/ or institutional rules and instruments (for example, the relevant Ombudsman).

An example of such would be the content screening that has been partially undertaken by Facebook on its own account and partly under the influence of national legislation, such as the pioneering German Netzwerkdurchsetzungsgesetz[198], (and most recently the Digital Services Act)[199]. This law requires commercial social networks to establish transparent procedures for dealing with complaints about illegal content, such as hate speech. Furthermore, social networks are required to (i) check complaints immediately, (ii) delete 'obviously illegal' content within 24 hours, and (iii) delete any illegal content within 7 days after checking it and block public access to it. Documentation regarding each complaint and its content must be stored for at least 10 weeks.

On this point, the regulatory debate surrounding digital platforms converges strongly with the debate concerning a fairer and/or more sustainable system of private governance regarding production GVCs. After more than a decade of relatively ineffective experimentalism with various instruments of corporate social responsibility (henceforth, 'CSR'), a reinvigorated interest in and engagement with possible legislative interventions can

[197] A. Wright and P. De Filippi, "Decentralized Blockchain Technology and the Rise of Lex Cryptographia", (2015), <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2580664>.

[198] See German Federal Ministry of Justice and Consumer Protection, Act to Improve Enforcement of the Law in Social Networks ('Network Enforcement Act'), 2017, <https://www.bmjv.de/SharedDocs/Gesetzgebungsverfahren/Dokumente/NetzDG_engl.pdf?__blob=publicationFile&v=2>; for a comprehensive overview of legal issues see M. Eifert and T. Gostomzyk, *Netzwerkrecht: Die Zukunft des NetzDG und seine Folgen für die Netzwerkkommunikation*, (Nomos, 2018).

[199] Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) [2022] OJ L 277/1.

be observed.[200] These depart from mere market-based forms of regulation – they have introduced and developed markets centred on ethical standards and reputational sanctions. Simultaneously, they have acknowledged the challenges and complexity inherent in such regulation and that what is required is a certain degree of participation by, and wilful compliance of, lead or keystone firms. The regulatory debate around GVCs certainly shows that regardless of the legal origin of regulatory initiatives, whether it be legislation, transnational standards, such as by the ILO or corporate codes of conduct, only regulation that can be effective will make a difference in the private governance regime of a chain. Likewise, for digital platforms and ecosystems, different pathways of regulation do exist, although a worthwhile objective would also be to implement these public values, such as fairness, *within* the private governance system of the respective platforms and ecosystems, through some form of in-built compliance.

C. The Failure of Contract Law and Competition Law in Engaging With Multiple Dimensions of Power: A Trigger for Regulatory Experimentation?

Contract and competition law take different perspectives towards private governance, with contract law being concerned with fairness of both the procedure and the substance of the contract from the individualistic vantage point of personal autonomy, and competition law adopting a broader remit, that of the market, economic sector, or even industry, intervening under liability rules whenever specific business conduct adopted by market players leads to market imperfections that harm consumers (intermediary and end users). The established, traditional toolkit of both legal fields fails however to come fully into terms with the governance techniques employed by platforms and ecosystems.

1. Contract law

As regards contract law, the limitations of the traditional approach are familiar from debates around GVCs.[201] First, contract law remains centred around individual contracts, not their interconnection as manifested in networks, ecosystems and other forms of complex economic organisation. Accordingly, the fairness test under the EU Unfair Terms Directive proceeds strictly contract by contract, clause by clause, without capturing user terms in their governance dimension. Second, the doctrines of contract law hardly grasp informal or soft elements of contractual governance arrangements, including reputational and other mechanisms used in long-term relationships. Many of the obstacles that the development of 'relational' contract theory had to overcome are linked to a narrow understanding of rights and obligations according to the black-letter contract rather than in contextual fashion, as is common in perspectives from economic sociology and institutional economics.[202] Third, the benchmark of

[200] G. Sarfaty, "Shining Light on Global Supply Chains", (2015) 56 *Harvard International Law Journal*, 419.
[201] See eg K.H. Eller, Is 'Global Value Chain' a Legal Concept? Situating Contract Law in Discourses Around Global Production, European Review of Contract Law, *16* (2020), 3-24.
[202] See eg S. Grundmann, Towards' a Private Law Embedded in Social Theory: Eine Skizze, 24 European Review of Private Law 409 (2016); David Campbell & Hugh Collins, Discovering the Implicit

tests for doctrines of unconscionability under contract law is largely procedural, pertaining to individual consent; in other words contract law pursues no independent (re-)distributive goal.[203] Taken together, these conceptual orientations severely limit the traditional contractual toolkit to scrutinise platform power.

For the most part, private law scholarship has focused on the contractual relations between platforms and end-users – it has not yet adopted an ecosystem perspective.[204] Similarly, in physical production, contract law scholarship has focused primarily on individual contractual relations while neglecting the systemic context of the chain. In the context of platforms, end-users and ecosystems, this view needs to be expanded in two ways. First, one needs to adopt an ecosystem perspective that encompasses the diverse set of economically dependent actors. Second, one needs to undertake inquiries not only into formal legal relations, but also into the extra-legal incentives and rules of cooperation, as is exemplified by prior work on contractual governance.[205] This heuristic approach concerning private governance can then, in turn, be used to inform a range of legal policies.

2. Competition Law

As regards competition law, the ability of neoclassical price theory inspired competition law to account for a multi-dimensional concept of (economic) power has been challenged[206]. Following the turn towards a 'more economic approach', competition law assesses power in the context of a specific relevant market, and focuses on limited parameters of competition, and in particular the price dimension of competition. Competition law interventions are also traditionally based on the assessment of specific types of business conduct relating to the exercise of power in a relevant market context, which is typically defined by assigning firms producing substitutable products to the same market, to the extent that their competitive constraints are interrelated. However in ecosystems, digital platforms are "multi-sided": a decision of a member to join the platform on side A will benefit members on the other side B; and vice versa, in the sense that to the extent that side B becomes more attractive, thanks to the new affiliation on side A, this will in return increase the utility of joining side A in the first place (so-called positive feedback loop). If we analyze each side of the platform seperatly, we will miss the drivers of the overall dynamics of power in ecosystems.[207] But even analyzing

Dimensions of Contracts, in Implicit Dimensions of Contract 25 (David Campbell et al. eds., 2003); K.H. Eller, Comparative Genealogies of "Contract and Society", German Law Journal 21 (2020), 1393.

[203] See the discussion in I. Lianos, B. Carballa Schmichowski, J. Lindeboom & C. Lombardi, Power in Food Value Chain – Theory and Metrics, in I. Lianos, A. Ivanov & D. Davis (eds.), *Global Food Value Chains and Competition Law* (CUP, 2022), 256-314 (discussing different mechanisms in competition law, contract law, unfair competition law and other alternatives to tame economic power and ist unfair consequences in the food sector, this discussion being transposable to other economic sectiors). For an analysis of inroads of political economy perspectives to contract law cf K.H. Eller, The Political Economy of Tenancy Contract Law: Towards Holistic Housing Law, (2022) 1 European Law Open 987.

[204] C. Petersen, V. Ulfbeck and O. Hansen, "Platforms as Private Governance Systems – The Example of Airbnb", (2018) *Nordic Journal of Commercial Law*, 39-61.

[205] For a comprehensive state-of-the-art overview, see S. Grundmann, F. Möslein and K. Riesenhuber (eds), *Contract Governance: Dimensions in Law and Interdisciplinary Research* (Oxford University Press 2015).

[206] See, CERRE, Making Economic Regulation of Platforms fit for the Digital Age – Part 3 Threshold for Intervention (Issue Paper, 4 September 2020) (on file with the authors).

[207] Jacobides/Lianos: Ecosystems and Competition Law in Theory and Practice, p. 12.

these markets collectively (by considering multi-sidedness, tying, or network externalities) does not replace a heads-on analysis of the ecosystem dependencies, since the focus of the former will remain on the dominance in one particular market.[208] Furthermore, this approach does not account for the possibility that power may be exercised at an ecosystemic level, as in situations in which a firm leverages its power from positions where it controls a bottleneck or chokepoint to other more competitive spaces, without necessarily this result being directly linked to the adoption of specific types of business conduct but results from the "ecosystem glue" and the perception by all economic actors of the connexionist source of power in such networks.[209]

Different concepts than 'market power' have been put forward as a trigger for regulatory/competition law intervention, recognising that power may not only emanate from the fact that a firm behaves independently from its customers and trade partners in a specific relevant market, but because of its positioning at the level of an ecosystem, defining its architecture: 'strategic market status'[210], 'conglomerate market power' and 'intermediation power'[211], 'structuring digital platforms'[212], or 'gatekeepers'[213], are meant to complete, or even substitute, the archetypical concept of market or monopoly power in competition law[214].

Although the emergence of digital ecosystems has been the trigger and irritant for the interest shown by public authorities in the digital platforms' phenomenon, the concept of ecosystem was not elaborated in most of the reports that such public authorities commissioned to explore the possibilities of legal change. The concept was at best used descriptively and sometimes as an alternative to the concept of digital platform, without any proper effort being

[208] Jacobides/Lianos: Ecosystems and Competition Law in Theory and Practice, p. 14.

[209] L. Boltansli & E. Chiapello, *The New Spirit of Capitalism* (Verso, 2007), 111 (noting that in a „connexionist world", the network metaphor does not aim to describe the social interactions (economic transactions) occurring between the various actors of interest, but becomes the essence of economic interactions, as in a network world the game is to 'multiplying connections and proliferating links, the succession of projects' having the effect of 'extending networks'); Jacobides/Lianos: Ecosystems and Competition Law in Theory and Practice, p. 11;

[210] Report of the Digital Competition Expert Panel, Unlocking digital competition (March 2019), available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf (hereinafter Furman Report), p. 55, §2.10, noting that this term indicates 'those in a position to exercise market power over a gateway or bottleneck in a digital market, where they control others' market access'.

[211] Report for the Federal Ministry for Economic Affairs and Energy (Germany), Modernising the law on abuse of market power (English long abstract), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3250742, the first concept denoting a '(possibly) specific form of power which may significantly endanger competition even below the market dominance threshold', while the second refers to the fact that intermediaries dispose of privileged access to consumer data and/or of 'a significant ability' to steer consumers'.

[212] ARCEP, Plateformes numériques structurantes, (December 2019), available at Plateformes numériques structurantes - Eléments de réflexion relatifs à leur caractérisation (Décembre 201ç) (arcep.fr).

[213] According to the Digital Markets Act (DMA) proposal (Article 3), gatekeepers are entities that (i) have a significant impact on the EU internal market, (ii) operate one or more important gateways to customers, and (iii) enjoy or are expected to enjoy an entrenched and durable position in their operations. The DMA definition is intended to apply to a particular dominant actor, where economic significance, scope, or size provide pragmatic grounds for concern about control over a significant part of the economy, and where the ecosystem in question is global rather than local or regional. See, Proposal for a Regulation of the European Parliament and of the Council on Contestable and Fair Markets in the Digital Sector (Digital Markets Act), SEC (2020) 437 final, available at proposal-regulation-single-market-digital-services-digital-services-act_en.pdf (europa.eu).

[214] For a discussion, see I. Lianos, B. Carballa-Smichowski, A Coat of Many Colours – New Concepts and Metrics of Economic Power in Competition Law and Economics, (2022) 18(4) *Journal of Competition Law & Economics*, 795-831.

made to define its contours, nor any reflection about the challenges ecosystems may pose to the existing conceptions of power and theories of harm in competition law.[215]

The Digital Markets Act refers to ecosystems only three times, and in its recitals (not the core text), however the concept of ecosystem was very much present in the discussions and negotiations, in particular regarding the qualitative criteria that could be considered for the designation of a gatekeeper: although there have been suggestions by some delegations as to the need to include among these criteria (which are not cumulative) the control of a business ecosystem, it was preferred to add as one of the factors in the analysis "a conglomerate corporate structure or vertical integration of that undertaking, for instance enabling that undertaking to cross-subsidize, to combine data from different sources or to leverage its position,"[216] which has a narrower scope, to the extent that it relies on a leveraging theory of harm and thus implicitly integrates a capability and incentives framework. The ecosystem concept has a more structuralist connotation and allows for intervention beyond the capability and incentives framework (which is more behaviouralist-driven). This missed occasion probably needs to be rectified in the next revision of the DMA, or at the designation decisions that refer to the qualitative criteria of Art. 3(8) of the DMA.[217]

The official entry of the concept of ecosystem in competition law jargon was however completed with the recently adopted European Commission market definition notice, which

[215] The concept is only mentioned 15 times in the Furman report (J. Furman et al, Unlocking digital competition, Report of the Digital Competition Expert Panel (2019), https://assets.publishing.service.gov.uk/media/5c88150ee5274a230219c35f/unlocking_digital_competition_furman_review_web.pdf). it is mentioned 105 times in the Report for the European Commission (Schweitzer et al, Competition policy for the digital era - Publications Office of the EU (europa.eu) (2019), 30 times at the Stigler commitee's report (Stigler Committee on Digital Platforms Final Report (2019) digital-platforms---committee-report---stigler-center.pdf (chicagobooth.edu), 98 times at the House of Representatives Majority Report, (Investigation of Competition in Digital Markets- Majority Staff Report and Recommendations (2020) templatelab.com/competition-in-digital-markets/), but 421 times at the BRICS Digital Era Competition Report which also dedicates specific Sections on ecosystem competition and ecosystem power (Lianos, Ioannis and Ivanov, Alexey, Digital Era Competition BRICS Report (August 30, 2019). Available at SSRN: https://ssrn.com/abstract=3901413 or bricscompetition.org/uploads/publications/brics-book-full-00d8c66ce2.pdf).

[216] Art. 3(8)(f) DMA.

[217] For the time being the Commission has not used these qualitative criteria and the concept of ecosystem appears scarcely in the designation decisions [see, however, the one on Meta which notes that "recital (3) of the preamble to Regulation (EU) 2022/1925 identifies as a common feature of platform ecosystems the ability to connect many business users with many end users through their services and to leverage the resulting advantage" (para. 305, available at https://ec.europa.eu/competition/digital_markets_act/cases/202346/DMA_100044_138.pdf] although it plays a more prominent role in the designation decision for Byte Dance, one of the arguments of Byte Dance for not being designated is that it lacks of an ecosystem and of significant network effects: see https://ec.europa.eu/competition/digital_markets_act/cases/202344/DMA_100040_141.pdf. The Commission responds to this argument noting that "nothing in Regulation (EU) 2022/1925 suggests that having an ecosystem is an absolute pre-requisite to be an important gateway for business users to reach end users. The existence of vertical integration and of an ecosystem of different services are part of a non-exhaustive list of several elements referred to in recitals (2) and (3) of the preamble to Regulation (EU) 2022/1925 which contribute to explaining the reasons why the legislators laid down the conditions under which certain CPSs constitute an important gateway for business users to reach end users. Recital (3) of that Regulation, in particular, states that "[s]ome of those undertakings exercise control over whole platform ecosystems […]," which makes clear that not all gatekeepers have such control over an entire ecosystem of services in the Union. Moreover, the very notion of an "ecosystem" comprises various business models and therefore each ecosystem needs to be assessed on a case-by-case basis, taking account of the various benefits or the lack thereof derived from such way of operating, in particular those that may impact contestability" (para. 130). Furthermore, it acknowledges that ByteDance does in fact operate its

dedicates a Section on "(digital) ecosystems,"[218] as a special case that is in a distinct Section in the analysis by the Commission from multi-sided platforms and categorized together with after-markets and bundles.[219] The Commission proceeds to a definition of "(Digital) ecosystems" "as consisting of a primary core product and several secondary (digital) products whose consumption is connected to the core product, for instance, by technological links or interoperability" and continues that "(w)hen considering (digital) ecosystems, the Commission may thus apply similar principles to those applied to after-markets to define the relevant product market(s)," actually taking a narrow perspective on the use of this concept that corresponds to one of the possible strategies ahead explored in the Jacobides/Lianos matrix for ecosystems analysis, thus not integrating yet the complexity of other complex systems than aftermarkets.[220] According to the Commission, "(a)lthough not all (digital) ecosystems fit an after-market or bundle market approach, the Commission takes into account, where relevant, factors such as network effects, switching costs (including factors capable of leading to customer lock-in) and (single- or multi-) homing decisions for the purpose of defining the relevant product market(s)."[221] These insights are to be welcomed, yet remain insufficient, hence it will be important to watch the way the Commission will implement these broad directions in its decisional practice. Some recent EU merger control decisions also engage with ecosystem theories of harm. As these have not yet been published, it is difficult to understand the way this plays out in practice.[222]

In contrast, the recently published U.S. DOJ and FTC Merger Guidelines do not engage with the concept of ecosystem, and refer to it only twice when describing the issues raised by the elimination by a merger of a nascent competitive threat.[223] They also limit the use of the concept in situations in which the incumbent retains and reinforces its dominant position by eliminating a nascent competitive threat, which is one of the possible scenarios of ecosystemic harm to competition.

The General Court of the EU also has employed the concept of ecosystem in the *Google Android* case[224], in which the Court examined the intensity of inter-ecosystem competition between Apple and Google and concluded that this was not of that extent to include the Apple ecosystem in the analysis of the competitive constraints Google faced in the different relevant

own ecosystem consisting of highly popular video-editing services, enterprise software, advertising, news, and healthcare applications" (para. 132).

[218] Commission Notice on the definition of the relevant market for the purposes of Union competition law, C/2024/1645, Section 4.5.

[219] Multi-sided platforms are covered by Section 4.4.

[220] M.G Jacobides & I. Lianos, Regulating platforms and ecosystems: an introduction, 2021) 30(5) *Industrial and Corporate Change* 1131, 1208 (Table 2).

[221] Commission Notice on the definition of the relevant market (2004), para. 104.

[222] For a discussion, see the event organized by the Centre for Law, Economics & Society at UCL Faculty of Laws, https://www.ucl.ac.uk/laws/events/2023/oct/rise-ecosystem-theories .

[223] US DOJ and FTC, Merger Guidelines (December 18, 2023), p. 20 (noting that "the nascent threat supports what may be referred to as "ecosystem" competition" and explaining that "ecosystem competition refers to a situation where an incumbent firm that offers a wide array of products and services may be partially constrained by other combinations of products and services from one or more providers, even if the business model of those competing services is different").

[224] Case T-604/18, *Google and Alphabet v. Commission* (Google Android), ECLI:EU:T:2022:541.

markets considered for establishing a bundling/tying practice.[225] The General Court examined the concept of ecosystem, acknowledging that a digital "ecosystem"

> brings together several categories of supplier, customer and consumer and causes them to interact within a platform, the products or services which form part of the relevant markets that make up that ecosystem may overlap or be connected to each other on the basis of their horizontal or vertical complementarity. Taken together, the relevant markets may also have a global dimension in the light of the system that brings its components together and of any competitive constraints within that system or from other systems.[226]

Having defined the concept of ecosystem as a distinct operational concept from that of relevant market, to the extent that it may concern many relevant markets, the General Court acknowledged that "(i)dentifying the conditions of competition relevant to the assessment of the position of economic strength enjoyed by the undertaking concerned may therefore require multi-level or multi-directional examination in order to determine the fact and extent of the various competitive constraints that may be exerted on that undertaking.[227]

This may open the door to a more holistic approach about ecosystem theories of harm, and also ecosystem power,[228] although it may also provide undertakings the possibility to put forward ecosystem-related efficiencies or justifications. This did not escape Google which effectively "dressed" its justification of the anti-fragmentation agreement as an effort to protect the security and integrity of its ecosystem.[229] The Commission, confirmed by the General Court, did not find this objective justification convincing.[230]

3. Locating the 'Black Spot' of Traditional Public Governance Tools: Ecosystem Power Asymmetries

One may conclude from the discussion that a 'black spot' for the more traditional public governance tools of contract and competition law is the power asymmetry/differential often existing between the platform orchestrator and the complementors, even if the power of the former does not extend to the whole market and is merely of relational nature (non-structural power). The concept of superior (or unequal) bargaining power is a well-known concept in the fields of contract law and unfair competition law,[231] where it has given rise to a considerable

[225] *Ibid*., para. 272.
[226] *Ibid*., para. 116.
[227] *Ibid*., para. 117.
[228] Not the reference of the General Court in para. 880 "suffice it to note that Google does not seriously call into question the findings set out in the contested decision relating to the superior market power of the 'Android ecosystem.'"
[229] *Ibid*., para. 857.
[230] *Ibid*., para. 878, 880 (noting "the extremely rapid growth of the 'Android ecosystem' from the early 2010s onwards makes Google's claims regarding the hypothetical risk that the threat which it describes to the very survival of that 'ecosystem' could have continued throughout the infringement period implausible. It follows that that justification must be rejected") & 884 (where it remarks, concerning Google's allegation of externalities that may affect the reputation of its ecosystem that "the risk of propagation to the detriment of the Android ecosystem has not been sufficiently established in the present case").
[231] See, for instance, for contract law, at the EU level, Article 4:109 (ex -art. 6.109) of the Principles of European Contract Law 2002 on excessive benefit or unfair advantage because at the time of the conclusion of the contract "was dependent on or had a relationship of trust with the other party, was in economic distress or had urgent

literature attempting to unveil its theoretical underpinnings.[232] Authors usually contrast the use of this concept in these areas of law, where the focus is on the unfairness of the process of exchange, with the efforts to integrate this rule in the field of competition law, where the emphasis is usually put on outcomes, such as efficiency or some parameter of consumer welfare, such as lower prices[233]. The underlying objective of contract law or unfair competition statutes consists in regulating the contest between contracting parties and ensuring a relatively equalised landscape of bargaining capacity, bargaining power being interpreted as the interplay of the parties' actual power relationship in an exchange transaction.[234]

On the contrary, competition law defines bargaining power more generally, in terms of the ability of an undertaking to introduce a deviation from the price or quantity obtained from the competitive situation in the market in which the transaction takes place. This approach emphasises the outcomes resulting from the presence of bargaining power relative to a situation in which it is absent (not necessarily that of perfect competition),[235] focusing on market structure and concentration.[236] European competition authorities are careful to distinguish between the respective fields of contract law, when issues of unconscionability, economic duress and undue influence are examined, and that of competition law, noting that "most of certain practices linked to imbalances of bargaining power between market players that are deemed unfair' 'do not fall within the scope of competition rules at EU level or in most Member States, as they did not affect consumer welfare"[237].

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needs, was improvident, ignorant, inexperienced or lacking in bargaining skill"; See, Principle 10 of the Draft Common Frame of Reference (DCFR) concerning restrictions to the principle of the freedom of contract because of inequality of bargaining power (even in the context of B2B relations) and the contract law sub-doctrines that explicitly or implicitly incorporate bargaining power such as unconscionability, duress, undue influence, the parol evidence rule and public policy. On unfair competition, again at the E.U. level, see Green Paper on unfair trading practices in the business-to-business food and non-food supply chain in Europe COM(2013) 37; Communication of the Commission, Tackling unfair trading practices in the business-to-business food supply chain, COM(2014) 472 final. See also the doctrines of 'unconscionable conduct', economic duress and undue influence in contract law in England & Wales, in particular the concept of economic duress, as vitiating elements for a contract. This type of duress "arises where one party uses his superior economic power in an 'illegitimate' way so as to coerce the other contracting party to agree to a particular set of terms": E. McKendrick, *Contract Law* (Palgrave Macmillan 2005) 358.

[232] *See* in particular the seminal cases *Lloyds Bank Ltd v. Bundy* [1974] EWCA Civ 8 (EWCA (Civ)); *Macaulay v. Schroeder Publishing Co Ltd* [1974] 1 WLR; and the following critical and explanatory appraisal by S. N. Thal, Inequality of Bargaining Power Doctrine: The Problem of Defining Contractual Unfairness, (1988) 8 *Oxford J. Legal Stud.* 17; M. J. Trebilcock, The Doctrine of Inequality of Bargaining Power: Post-Benthamite Economics in the House of Lords [1976] *University of Toronto L. J.* 359; L. A. DiMatteo, Equity's Modification of Contract: An Analysis of the Twentieth Century's Equitable Reformation of Contract Law (1998) 33 *New Eng. L. Rev*. 265; and more recently A. Choi and G. Triantis, The Effect of Bargaining Power on Contract Design [2012] *Va. L. Rev*. 1665.

[233] See, for such an approach P. Akman, *The Concept of Abuse in EU Competition Law: Law and Economic Approaches* (Hart Pub., 2012), 170-184.

[234] Yet, it is important to note that regulatory interventions in order to rebalance contractual inequality are still designed as exceptions to the principle of the freedom of contract and the certainty of the contract, especially in B2B contracts, where a very limited power to rebalance the contractual arrangement is generally left to the discretion of the judge.

[235] *See*, R. Clarke, S. Davies, P. W. Dobson and M. Waterson, *Buyer Power and Competition in European Food Retailing* (Edward Elgar 2002).

[236] J. T. Dunlop and B. Higgins, Bargaining Power and Market Structures, (1942) L(1) *The Journal of Political Economy* 1, 4-5; R. G. Noll, "Buyer Power" and Economic Policy, (2005) 72 *Antitrust Law J*. 589.

[237] ECN Activities in the Food Sector (May 2012), para. 26.

Regarding the concept of economic power, some scholars have tried to draw a clear boundary between bargaining power, which is considered a contract law issue, and monopoly power, which is viewed as a competition law issue, what we will call the separability thesis. Trebilcock distinguishes between the 'situational monopolists who may take advantage of its business partner by charging prices that are higher than its 'reference price', taking opportunistically advantage its business partner's temporary dependency'[238]. these monopolies being regulated by contract law, and 'structural monopolies' targeted by competition law, as the dominance of the monopolist is market-wide and non-transitory. However, these efforts have not led to a more vigorous enforcement vis-à-vis these forms of relational power in concentrated sectors, such as the food industry[239], although article 102 TFEU and the national law eqivalents relentlessly refer to unfair conducts or conditions and the imposition of conditions, in implemengting the concept of exploitative abuses. Inequality of bargaining power has also been used by the European Commission in several cases, especially to deal with situations of economic dependence[240], however with time this older case law has fallen into disuse. Provisions on superior bargaining power or economic dependence, introduced in the competition law statutes by some jurisdictions, have been typically examined from the perspective of efficiency and consumer welfare and usually relegated to the outer boundaries of competition law provisions on abuse of a dominant position, for instance on the basis of an error cost analysis, or the perception that they are a by-product of the political pressure of organised interests of small and medium undertakings, leading to the adoption of mainly redistributive statutes that restrict competition and presumably economic efficiency and which have little role to play in modern competition law[241]. The current tools of competition law seem also to focus solely on horizontal competition rather than on vertical competition and the distribution of surplus value along the value chain, excluding vertical fairness issues from the competition assessment, with the only exception of the allocation of surplus between consumers and producers[242].

The lack of enforcement of competition law with regard to certain segments of these digital ecosystems, particularly with regard to collective bargaining of gig workers[243], and calls for the withdrawal of net neutrality regulations[244], seem more compatible with a *laissez-faire*

[238] M Trebilcock, *The Limits of Freedom of Contract*, 94.

[239] See, the analysis, in I. Lianos, Carballa Smichowski, B., Lindeboom, J., & Lombardi, C., Power in the Food Value Chain: Theory and Metrics. In I. Lianos, A. Ivanov, & D. Davis (Eds.), *Global Food Value Chain and Competition Law*, (Cambridge University Press, 2022).

[240] See Commission Decision of 19 December 1974, General Motors; Commission Decision of 19 April 1977, ABG/Oil companies operating in the Netherlands; Commission Decision of 8 December 1977, Hugin/Liptons; Commission Decision of 21 December 1988, Magill TV Guide.

[241] F. Jenny, The "Coming Out" of Abuse of Superior Bargaining Power in the Antitrust World, in the *Annual Proceedings of the Fordham Competition Law Institute, International Antitrust Law and Policy*, Hawke, B. (ed) (Juris Publishing, 2009)

[242] Horizontal fairness issues are also excluded from the analyses, as, for instance, there is no difference made between vulnerable and non-vulnerable consumers within the category of consumers.

[243] For a discussion, see I. Lianos, Reconciling Antitrust Standards and Collective Bargaining Rights: Towards a New Analytical Framework in EU Competition Law. In W. Bernd, & C. Hieíl (Eds.), *Collective Bargaining for Self-Employed Workers in Europe Approaches to Reconcile Competition Law and Labour Rights* (Wolters Kluwer, 2021)

[244] O. Andriychuk, (Why) Did EU Net Neutrality Rules Overshoot the Mark? Internet, Disruptive Innovation and EU Competition Law & Policy, (2018) 18 Yearbook of Antitrust and Regulatory Studies 227-239.

approach, as a way of avoiding the intervention of heavier tools of public governance, the aim being to engineer a more balanced private governance system, through the emergence of countervailing powers along the digital value chain. Similar arguments have been made for the development of countervailing powers that would thwart the power of digital platforms through code, such as the ability of consumers to outsource purchasing tasks to algorithms and, thereby, minimise the direct role they play in purchasing decisions and overcoming biases "to enable more rational and sophisticated choices".[245]. These failures explain the recent discussions over the need to expand the traditional public governance toolkit.

D. 'New' Tools of Public Governance: Enablers or Corrective Devices to Self-Regulation?

The resurgence of the 'power rhetoric' has led number of jurisdictions to tackle upfront the Big Tech phenomenon, abandoning the 'laissez-faire' approach and their sole or dominant reliance on private governance tools to deliver the expected social benefits of digital innovation, in view of the important social externalities resulting from the emergence of Big Tech platforms and the increasing levels of economic concentration, and acknowledging the failure of traditional more "light-touch" public governance approaches, such as established doctrines of contract law or competition law. A significant effort of regulatory innovation followed, the public governance space being broadened up with new regulatory tools. These are sometimes perceived as complements/enablers, and sometimes as 'substitutes'/corrective devices, to instruments of private governance, such as self regulation or the regulating (architectural) power of digital platforms in business ecosystems. These tools aim to also cater for different public values that may be threatened by the phenomenon of Big Tech: they recognise not only that the negative externalities of the domination of large business ecosystems cannot be internalised by the institutions of private governance, even if these are jointly used with more traditional tools of public governance, such as contract law and/or competition law, but also that the multi-dimensionality of such externalities may not accord well with the compartimentalisation of the legal system in different fields of law (e.g. competition law, contract law, labour law), dealing with very specific problems, and without holding a unifying vision for the public governance of digital capitalism and the digital platforms/ecosystems phenomenon[246]. We will focus on the EU and the UK.

1. The Emergence of a Strong Public Governance Regime: Digital Utilities' Regulation in the Era of the DMA, Data Act and DSA

The contestable markets hypothesis and the emphasis on the dynamic capabilities of the central unit of the digital platform in ecosystems finds its limits in the paradox of an increasing

[245] M. Gal and N. Elkin-Koren, "Algorithmic Consumers", (2017) 30(2) *Harvard Journal of Law and Technology*, 309.

[246] For an in depth criticism of this situation see, M.K. Land, The Problem of Platform Law: Pluralistic Legal Ordering on Social Media, in P. Schiff Berman (ed.), *The Oxford Handbook of Global Legal Pluralism* (OUP, 2020), 974; I. Lianos, Value extraction and institutions in digital capitalism: Towards a law and political economy synthesis for competition law, (2022) 1(4) *European Law Open*, 852-890.

trend to economic concentration while innovation occurred and is still emerging in more decentralised, open, and even non-profit, business environments[247]. Enhancing inter-ecosystem competition may not suffice because of the strength of network effects/economies of scale or scope and the existence of tipping points, which make digital ecosytems move easily to situations of dominance, and often in a quicker pace than traditional markets, an argument may be made in favour of a more pervasive regulation.

There are different options depending on the dominant understanding of the source of these externalities. Some would put forward a natural monopoly claim, to the extent that digital platforms may present characteristics of a natural monopoly, as entry into the industry requires high fixed costs and the industry also faces declining average costs, once the 'entry fee' (fixed costs of production) into the industry is paid[248]. Unlike traditional utilities, these network effects are not an "exogenously given technological characteristic", but result from a "conscious, design choice about how to connect users and build a scalable business model around it".[249] Another approach will be not to only rely on the neoclassical IO concept of natural monopoly as a triggering factor for regulation, but to adopt a political economy perspective that would aim to address the concerns that the dominance of 'keystone firms' on ecosystems on which depend thousands of firms pose to economic development[250], as well as more broadly to society and to the future of the democratic system[251].

The Digital Markets Act (DMA) in the EU establishes, for instance, a specific *ex ante* regulatory regime for certain large digital platforms, that can be identified as 'gatekeepers'.[252] This regulatory regime does not aim to regulate entry or rates/output, as does traditional utility regulation, but sets some bright-line rules for business conduct that would be considered problematic: safeguarding fairness and contestability of core platform services provided by gatekeepers[253]. The DMA further recognises that fairness and contestability are intertwined,

[247] For instance, in the field of AI, OpenAI, first developed as a non-profit, provides a telling example.

[248] For a thorough discussion of this possibility see, F. Ducci, *Natural Monopolies in Digital Platform Markets* (CUP, 2020); I. Lianos, Value extraction and institutions in digital capitalism: Towards a law and political economy synthesis for competition law, (2022) 1(4) *European Law Open*, 852, spec., 881-884.

[249] Digital Markets Competition Forum, Value Preserving Platform Regulation, Network Effects, Platform Value, and Regulatory Remedies, Summary Report (16 July 2020) 14–16, spec. 14.

[250] A. Andreoni, S. Roberts, Governing digital platform power for industrial development: towards an entrepreneurial-regulatory state, (2022) 46(6)*Cambridge Journal of Economics*, 1431–1454.

[251] See, inter alia, A. Reyna, *Why Competition Law Must Protect Democracy—A European Perspective*, DAF/COMP/GF/WD, (2017), 36; S. W. Waller, *Antitrust and Democracy*, (2019) 46 Florida State University Law Review 807; Digital Platform Governance: Proposals Index | Belfer Center for Science and International Affairs (noting the high risks posed, because of network effects, of misimnformation and disinformation at scale, extremism and radicalisation online, harassment, reduced pluralism and freedom in media, hate speech at scale).

[252] According to the Digital Markets Act (DMA) l (Article 3), gatekeepers are entities that (i) have a significant impact on the EU internal market, (ii) operate one or more important gateways to customers, and (iii) enjoy or are expected to enjoy an entrenched and durable position in their operations. The DMA definition is intended to apply to a particular dominant actor, where economic significance, scope, or size provide pragmatic grounds for concern about control over a significant part of the economy, and where the ecosystem in question is global rather than local or regional. The Commission has already designated 6 gatekeepers. See, Digital Markets Act: Commission designates six gatekeepers (europa.eu) .

[253] According to the Preamble of the DMA, para. 32, "(f)or the purpose of this Regulation contestability should relate to the ability of undertakings to effectively overcome barriers to entry and expansion and challenge the gatekeeper on the merits of their products and services". Likewise, according to Recital 33 of the Preamble, "(f)or the purpose of this Regulation, unfairness should relate to an imbalance between the rights and obligations of business users where the gatekeeper obtains a disproportionate advantage. Market participants, including business users of core platform services and alternative providers of services provided together with, or in support of, such

and therefore an obligation imposed may address both goals at the same time[254]. To accomplish the public values of contestability and fairness, the regulation identifies some core platform services[255] to which are imposed specific regulatory obligations[256]. For instance, regarding conduct that enables gatekeepers to leverage their dominance from one CPS to another or to some other economic activity, the DMA prohibits some forms of conduct imposing specific regulatory obligations to gatekeepers, which can be either directly applicable or will require some further specification[257]. This conduct-focus remains distinct from competition law enforcement in terms of legislative drafting and methodology, as the implementation of the DMA does not require an individualised assessment of market positions and behaviour, including the likely effects and the precise scope of the prohibited behaviour, and does not provide for the possibility of undertakings to put forward objective justifications for the conduct in question[258]. The gatekeeper shall ensure and demonstrate compliance with the obligations laid down in the DMA[259]. The aim followed by the legislator is to accelerate the pace of public intervention in these markets, in comparison to traditional competition law enforcement, which is perceived as slow and ineffective in markets that have already tipped.

core platform services, should have the ability to adequately capture the benefits resulting from their innovative or other efforts".

[254] DMA, Recital 34 ("The lack of, or weak, contestability for a certain service can enable a gatekeeper to engage in unfair practices. Similarly, unfair practices by a gatekeeper can reduce the possibility of business users or others to contest the gatekeeper's position").

[255] These include: (i) online intermediation services (incl. for example marketplaces, app stores and online intermediation services in other sectors like mobility, transport or energy), such as Online B2C intermediation services which include marketplaces such as Amazon Marketplace and app stores such as Apple App Store or Google Play store; (ii) online search engines, such as Online search engines such as Google search or Microsoft Bing; (iii) social networking, such as Facebook; (iv) video sharing platform services, such as YouTube; (v) number-independent interpersonal electronic communication services, such as WhatsApp, Skype or Gmail; (vi) operating systems, such as Google Android, Apple iOS, Microsoft Windows; (viii) Cloud computing services such as Amazon webservice or Microsoft Azure; (viii) advertising services offered by a provider of any of the core platforms services mentioned above including ad networks, ad exchanges and any ad intermediation services such as Google AdSense; and (ix) virtual assistants, assistants such as Siri, Alexa.

[256] Art. 5, 6 and 7 of the DMA.

[257] These include the following: (i) Refrain from combining personal data sourced from CPS with personal data from other services of the gatekeeper or third-parties, and from signing in end-users to other services of the gatekeeper in order to combine personal data, unless the end-user has been presented with the specific choice and provided meaningful consent (Art. 5a); (ii) Bundling the CPS for which the online platform has a gatekeeper position with ID services (Art. 5e); (iii) Bundling several CPSs offered by the platform and for which the gatekeeper designation applies (Art. 5f); (iv) Refrain from using, in competition with business users, any data not publicly available, which is generated through activities by those business users of its CPS or provided by those business users or their end-users (Art. 6(1)a); (v) Allow end-users to uninstall pre-installed apps on its CPS Art. (6(1)b); (vi) Allow the use of third-party apps and app stores using, or interoperating with the OS of the gatekeeper and allow these apps and app stores to be accessed by means other than the CPS of the gatekeeper (side loading) (Art. 6(1)c); (vii) Refrain from technically restricting the ability of end-users to switch between different apps and services to be accessed with the OS of the gatekeeper (Art. 6(1)e); (viii) Provide effective, continuous and real-time portability of data generated through the activity of a business user or its end-user, in particular with tools for end-users to facilitate the exercise of data portability (Art. 6(1)g); (ix) Provide business users (or third parties authorised by them) free of charge, with effective, high-quality, continuous and real-time access to data, that is provided for or generated in the context of the use of the CPS by those business users and their end-users (Art. 6(1)i); (x) Provide to any third-party providers of online search engines with access on FRAND terms to ranking, query, click and view data in relation to search generated by end-users on online search engines of the gatekeeper (Art. 6(1)j & 7(6)).

[258] DMA, Preamble, Recital. 10.

[259] DMA, Article 8.

The legislation also recognises that 'common carrier' type regulation[260], such as that imposing duties on specific large digital platforms (the gatekeepers), in view of their systemic importance and the architectural power they dispose in their ecosystems, but also more broadly to the whole economy, requires far-reaching duties and an elaborate institutional setting, public and private enforcement, both at the EU and national levels[261].

The implementation of the DMA fully recognises the limits of private governance through self-regulation or the governing role of the digital platforms to achieve contestability and fairness, and aims to respond to potential harm to business and end users, through some form of public governance intervention in order to achieve an optimal level of inter-ecosystem and intra-ecosystem competition[262]. Although traditionally utilities-like regulation has been perceived as excessively focusing on static effects, sometimes to the price of ignoring innovation and dynamic effects, the dynamic relation between regulation, business risk, and innovation has increasingly been a feature of modern utilities' regulation[263]. The 'future-proofing' of the DMA is guaranteed with the procedure of market investigations[264], in particular for the purpose of examining whether one or more services within the digital sector should be added to the list of core platform services or for the purpose of detecting practices that limit the contestability of core platform services or that are unfair and which are not effectively addressed by the DMA[265].

It is important here to acknowledge that the opening of the access to the ecosystem controlled by a gatekeeper results from a balancing by the legislator of the positive externalities of the governing role ensured by the gatekeeper in this collective innovation effort, and the negative externalities some of its business conduct may bring to the participants to the ecosystem (including its business and end users), but also stakeholders more broadly (the general public) that may be affected by the lack of inter-ecosystem and/or intra-ecosystem competition[266]. With regard to the regulatory obligations imposed, the gatekeeper does not

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[260] For a discussion of this concept see C. S. Yoo, Common Carriage's Domain, (2018) 35 Yale Journal on Regulation 991.

[261] The DMA proposals were put forward by DG Competition and DG Connect, Directorate F: Digital Single Market — Unit F2: E-Commerce & Platforms. Its enforcement will involve apart from the Commission, also designated National Competition or Regulatory Authorities and national courts (for private enforcement).

[262] DMA, Preamble, Recital 7 ("the purpose of this Regulation is to contribute to the proper functioning of the internal market by laying down rules to ensure contestability and fairness for the markets in the digital sector in general, and for business users and end users of core platform services provided by gatekeepers in particular"). Although the DMA employs the term "ecosystem" only three times, it is widely accepted that the Commission considers that both the goals of contestability and fairness will be maximised by the promotion of inter-ecosystem and intra-ecosystem competition. See, P. Hornung, The Ecosystem Concept, the DMA, and Section 19a GWB, (2023) Journal of Antitrust Enforcement jnad049, https://doi.org/10.1093/jaenfo/jnad049 .

[263] HM Government, Encouraging innovation in regulated utilities: consultation (October 2018), available at Encouraging innovation in regulated utilities: consultation (publishing.service.gov.uk) .

[264] European Commission, Questions and Answers: DMA, available at Q&A: DMA: Ensuring fair and open digital markets (europa.eu) ("(e)nsuring that the Digital Markets Act is and remains future proof has been a key objective of the Commission from the start, and it was strongly retained in the final agreement").

[265] DMA, Article 19.

[266] There is some analogy here with the balancing of innovation incentives referred to by the Commission in its Priority Guidance with regard to the duty to supply (access) in the presence of a regulatory obligation to deal. The Commission notes in its Priority Guidance for Article 102 TFEU that if regulation compatible with EU law already imposes an obligation to supply on the dominant undertaking and it becomes clear, from the considerations underlying such regulation, that the necessary balancing of incentives has already been made by the public authority when imposing such an obligation to supply, then imposing an obligation to supply will not be

enjoy any discretion to make access to the ecosystem conditional on the specific contractual or technical requirements prohibited by the DMA, with the exception however of relatively narrow circumstances in which the integrity of the core platform service in question, or the security and privacy of its users is at risk, and of course if this is "strictly necessary and proportionate"[267]. Under these narrow circumstances, or "exceptional circumstances" of "limited grounds of public health or public security laid down in Union law and interpreted by the Court of Justice"[268], the values of contestability and fairness may be 'sacrificed' in order to ensure other public values, of essence for both private and public governance. However, the discretion left to the private governance of ecosystems is quite limited, in view of the strict conditions to which such 'exceptions' to the values of contestability and fairness are subject to before being put forward successfully by gatekeepers[269]. These values also have a strong public dimension, to the extent that they are imposed by EU regulatory law, and thus do not result purely from private decision-making[270]. In conclusion, the DMA recognises that a small number of large undertakings providing core platform services have emerged with considerable economic power, which in combination with some forms of business conduct may lead "to serious imbalances in bargaining power and, consequently, to unfair practices and conditions for business users, as well as for end users of core platform services provided by gatekeepers, thus subjecting them to an enhanced regime of public governance akin to modern utilities' like regulation.

A public governance regime to ensure access to data may also be necessary for undertakings that are not designated as gatekeepers or very large online platforms and search engines, within the scope of the DMA. Some of the provisions of the DSA apply to most online platforms providing intermediary services. The EU Data Act complements the DMA, by focusing on barriers to data sharing, and adapts rules of contract law with the aim "to prevent the exploitation of contractual imbalances that hinder fair data access and use for micro or

considered as capable of having negative effects on the input owner's and/or other operators' incentives to invest and innovate. See, Communication from the Commission — Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings, [2009] OJ C 45/7, para. 81.

[267] See, Art. 6(4), 6(7), 7(9) for integrity; Art. 6(4) and 7(9) for security; Art. 7(9) for privacy. For a discussion, P. Hornung, The Ecosystem Concept, the DMA, and Section 19a GWB, (2023) Journal of Antitrust Enforcement, at 26-27.

[268] DMA, Recital 67 (in these circumstances, "the Commission should be able to decide that a specific obligation [imposed by the DMA] does not apply to a specific core platform service. If harm is caused to such public interests that could indicate that the cost to society as a whole of enforcing a certain obligation is, in a specific exceptional case, too high and thus disproportionate" […] This should ensure the proportionality of the obligations in this Regulation without undermining the intended *ex ante* effects on fairness and contestability. Where such an exemption is granted, the Commission should review its decision every year. ") and Art. 10.

[269] See, for instance (concerning security), DMA, Recital 50 ("in order to ensure that third-party software applications or software application stores do not undermine end users' security, it should be possible for the gatekeeper to implement strictly necessary and proportionate measures and settings, other than default settings, enabling end users to effectively protect security in relation to third-party software applications or software application stores if the gatekeeper demonstrates that such measures and settings are strictly necessary and justified and that there are no less-restrictive means to achieve that goal. The gatekeeper should be prevented from implementing such measures as a default setting or as pre-installation").

[270] See, DMA, Recitals 64 & 65, the DMA noting the importance of such (public) values provided for by legislation on consumer protection, cyber security, product safety and accessibility requirements to be integrated "as much as possible into the technological design used by the gatekeepers".

medium-sized enterprises"[271]. These concerns particulary arise in concentrated economic sectors, in which "there may only be limited options available to users for the access to and the use and sharing of data. In such circumstances, contracts may be insufficient to achieve the objective of user empowerment, making it difficult for users to obtain value from the data generated by the connected product they purchase, rent or lease"[272]. As it is recognised in the text of the Data Act, "a small number of very large enterprises have emerged with considerable economic power in the digital economy through the accumulation and aggregation of vast volumes of data and the technological infrastructure for monetising them", these including "undertakings that provide core platform services controlling whole platform ecosystems in the digital economy and which existing or new market operators are unable to challenge or contest"[273]. It also provides some public law type regulatory obligations to promote contestability by enabling switching between data processing services; finally, it enhances the interoperability of data and data-sharing mechanisms and services[274]. By containing general access rules, whenever a data holder is obliged by law to make data available to a data recipient, the Data Act, also stipulates that such access rules should be based on fair, reasonable, non-discriminatory and transparent conditions[275]. Similarly, unfair contract terms imposed to small and medium-sized enterprises are also prohibited[276]. The Regulation also recognises the principle that all persons can have access to the data they generate[277], although the Act also indirectly recognizes a quasi-property right for the platforms harvesting this data.[278] Parts of the Data Act present a similar focus than specific initiatives in the food supply chains to balance the asymmetrical or relational power between market participants[279], often a topic of concern for contract law, but also for some national competition authorities, which employ the concept of abuse of economic dependence to deal with such situations[280].

Limiting contestability and fairness by, for instance, rendering access to data more difficult are not the only externalities that may be caused by the emergence of digital ecosystems; others relate to broader concerns than business or end user harm, and relate for instance to harm to the democratic process and/or fundamental rights, leading to the expansion

[271] Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act), [2023] OJ L, 2023/2854, Recital 5.
[272] Data Act, Recital 27.
[273] Data Act, Recital 40.
[274] Data Act, Recital 5.
[275] Ibid., Recital 38.
[276] See, Art 13 of the Data Act.
[277] Ibid., Preamble, para. 20.
[278] See, M. Eckardt, and W. Kerber, Property Rights Theory, Bundles of Rights on IoT Data, and the EU Data Act (February 26, 2023). forthcoming in: European Journal of Law & Economics, special issue on "The Law and Economics of the Data Economy", Available at SSRN: https://ssrn.com/abstract=4376833 .
[279] On the inclusion of substantive fairness norms in contract law and the development of special regimes dealing with relational power asymmetries, see I. Lianos, B. Smichowski, J. Lindeboom & C. Lombardi, Power in the Food Value Chain, in I. Lianos, A. Ivanov, D. Davis (eds.), Global Food Value Chains and Competition Law (CUP, 2022), 256.
[280] For a discussion, see I. Lianos, V. Korah, P. Siciliani, *Competition Law: Analysis, Cases and Materials* (OUP, 2019), 837-844.

of the utlities' like regulation (or other regimes of public governance) in the digital sphere (see Table 3)[281].

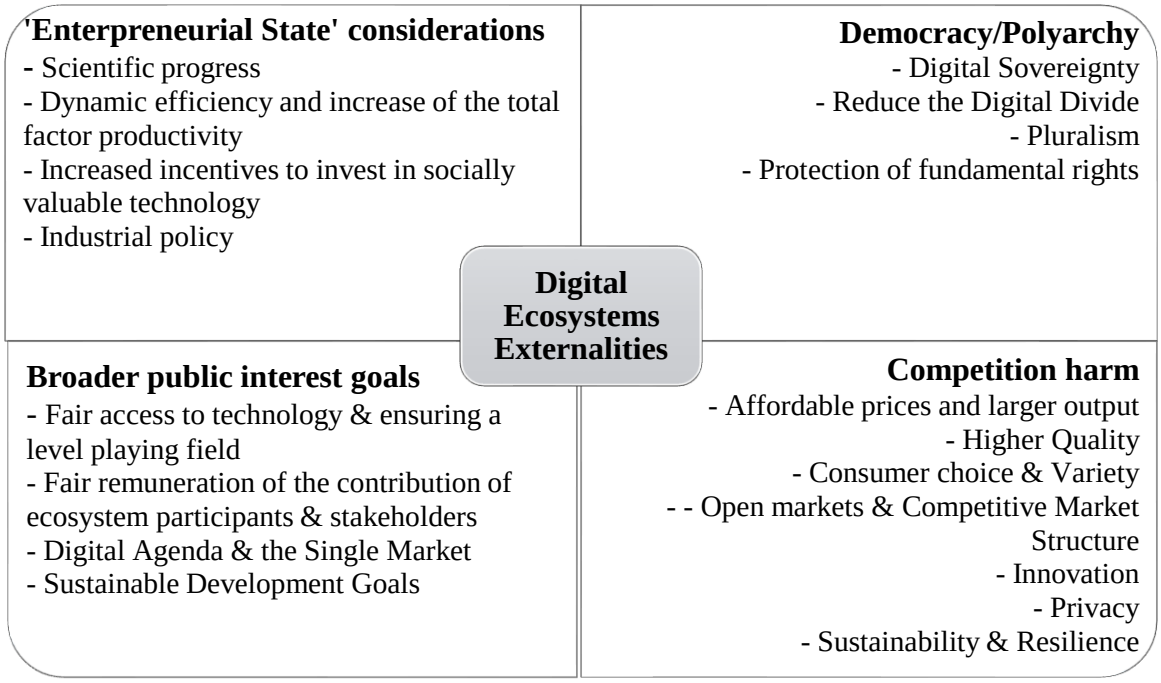

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Table 3: Digital Platforms' Externalities & Public Values

The Digital Services Act (DSA) constitutes another example of such regulation, although combining a regulation of common carrier/digital utilities' analogy with a systemic risk regulation approach. The DSA applies to intermediary services[282], and stems from the recognition that "(r)esponsible and diligent behaviour by providers of intermediary services is essential for a safe, predictable and trustworthy online environment and for allowing Union citizens and other persons to exercise their fundamental rights guaranteed in the Charter of Fundamental Rights of the European Union […] in particular the freedom of expression and of information, the freedom to conduct a business, the right to non-discrimination and the

[281] These may be tought of as the externalities of the centralized private governance of digital ecosystems. On the concept of externality in economics, and its necessary re-conceptualization, according to the perspective of the public good, see for instance A. Papandreou, *Externality and Institutions* (OUP, 1998); M. Fleurbaey, R. Kanbur, B. Viney, Social Externalities and Economic Analysis, (2021) 18(1) Social Research 171.

[282] These are according to Art. 2 lit. g DSAA: (i) a 'mere conduit' service, consisting of the transmission in a communication network of information provided by a recipient of the service, or the provision of access to a communication network; (ii) a 'caching' service, consisting of the transmission in a communication network of information provided by a recipient of the service, involving the automatic, intermediate and temporary storage of that information, performed for the sole purpose of making more efficient the information's onward transmission to other recipients upon their request; (iii) a 'hosting' service, consisting of the storage of information provided by, and at the request of, a recipient of the service.

attainment of a high level of consumer protection" [283], but also the protection of minors[284]. The aim is to establish a regime of public governance to deal with several 'systemic risks' that may arise from the online distribution of content[285]. While the concept of 'intermediary services' encompasses a broad range of services[286], the DSA puts particular emphasis on the regulation of online platforms, and in particular "very large online platforms and of very large online search engines"[287] to the extent they "may cause societal risks, different in scope and impact from those caused by smaller platforms"[288], which are subject to specific additional obligations in Art. 33-47 DSA. The obligations to which online platforms are imposed include among others transparency reporting, due account of fundamental rights in the terms of service and notice and action mechanisms for illegal content. It is specifically mentioned that "very large online platforms and of very large online search engines should focus on the systems or other elements that may contribute to the risks", by ensuring the compliance of all the tools of private governance they already use to control the ecosystem, such as algorithmic systems, in particular their recommender systems and advertising systems, data collection and use practices, terms and conditions, as well as content moderation processes, technical tools and allocated resources[289].

Since the DSA is not (primarily) concerned with the issue of market power, there is no *general* restriction of the scope of application since turnover or user numbers. The DSA does, however, establish a limitation of obligations for micro and small enterprises[290] and, as mentioned above, an expansion of obligations for so-called "very large online platforms and

[283] DSA, Recital 3.
[284] DSA, Recital 71.
[285] These can be of four sorts: First, risks associated with the dissemination of illegal content, such as the dissemination of child sexual abuse material or illegal hate speech or other types of misuse of their services for criminal offences, and the conduct of illegal activities, such as the sale of products or services prohibited by Union or national law, including dangerous or counterfeit products, or illegally-traded animals. Second, risks associated with the actual or foreseeable impact of the service on the exercise of fundamental rights, as protected by the Charter, including but not limited to human dignity, freedom of expression and of information, including media freedom and pluralism, the right to private life, data protection, the right to non-discrimination, the rights of the child and consumer protection. Third, risks concerning the actual or foreseeable negative effects on democratic processes, civic discourse and electoral processes, as well as public security. Fourth, risks stemming from from similar concerns relating to the design, functioning or use, including through manipulation, of very large online platforms and of very large online search engines with an actual or foreseeable negative effect on the protection of public health, minors and serious negative consequences to a person's physical and mental well-being, or on gender-based violence. DSA, Recitals 80-83.
[286] DSA, Recital 29 ("Intermediary services span a wide range of economic activities which take place online and that develop continually to provide for transmission of information that is swift, safe and secure, and to ensure convenience of all participants of the online ecosystem").
[287] DSA, Recital 75 ("Given the importance of very large online platforms, due to their reach, in particular as expressed in the number of recipients of the service, in facilitating public debate, economic transactions and the dissemination to the public of information, opinions and ideas and in influencing how recipients obtain and communicate information online, it is necessary to impose specific obligations on the providers of those platforms, in addition to the obligations applicable to all online platforms. Due to their critical role in locating and making information retrievable online, it is also necessary to impose those obligations, to the extent they are applicable, on the providers of very large online search engines. Those additional obligations on providers of very large online platforms and of very large online search engines are necessary to address those public policy concerns, there being no alternative and less restrictive measures that would effectively achieve the same result").
[288] DSA, Recital 76.
[289] DSA, Recital 84.
[290] See Art. 19 DSA.

search engines".[291] The latter have to comply with additional obligations, in particular, an elaborate assessment of the risks stemming from the design or functioning of their service and the establishment of appropriate counter for the risks that have been identified[292], both of which will be subject to annual independent audits.

2. The P2B Regulation and Codes of Conduct as Hybrid Private/Public Governance Regimes

Another option is to rely on tools of private governance, managed by some light touch form of public governance, such as transparency regulation, and/or to adopt bespoke regulatory regimes that integrate the business and operational models of digital platforms, thus leaving more space for differentiation to the various regimes of private governance of (digital) ecosystems.

The first option was put forward by the European Commission in the *Platform to business regulation*, where duties of non-discrimination and transparency were imposed to most digital platforms, irrespective of their market power[293].

The emergence of bespoke regulation enables digital platforms to frame the public governance regime at the image of the private governance design they have selected, in particular their business and operational models. One may for instance refer to Art. 45 et seqq. DSA, which encourages platforms to draw up voluntary codes of conduct in cooperation with the Commission to ensure the proper application of the DSA. This would result from a concerted effort of the digital platforms and unidentified 'stakeholders' and would complement platform regulation with a clearer and more easily applied set of standards defining the boundaries of undesirable conduct in digital markets. One may contrast this 'light touch' approach with the more 'hard law' of the DMA and other provisions of the DSA.

Another legislative proposal attempting to accommodate a more hybrid interaction between private and public governance is the UK Digital Markets, Competition and Consumer Bill.[294] The current draft generally follows the DMA in acknowledging the need for ex ante regulatory tools to tackle the competitive constraints caused by the distribution of power in digital market structures. It also shows similarities regarding the regulatory technique of the DMA, as it adopts a two-step process of (1) identifying problematic actors in a designation procedure and (2) obliging them to follow a pre-determined set of rules and standards. However, both of these steps somewhat differ from the approach taken by the DMA in the details to the extent that they retort to a different mix of both public and private governance solutions.

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[291] See Section 5 of the DSA (Art. 33 et seqq.) These are defined in terms of number of users (online platforms and online search engines which have a number of average monthly active recipients of the service in the Union equal to or higher than 45 million). The Commission has recently designated 17 Very Large Online Platforms (VLOPs) and 2 Very Large Online Search Engines (VLOSEs) that reach at least 45 million monthly active users: see, DSA: Very Large Online Platforms and Search Engines (europa.eu)

[292] See Art. 34 and 35 DSA.

[293] Regulation 2019/1150, of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services, [2019] OJ L 186/57.

[294] The bill is pending in the House of Lords as of March 2024. The current draft is available here https://bills.parliament.uk/publications/54208/documents/4421

First, the designation procedure under the UK Bill is more flexible, since it does not take the approach of defining quantitative thresholds for the identification of the addressees. The Bill relies on a purely qualitative criteria, when determining which companies have strategic market status (which can be seen as the equivalent to the DMAs gatekeeper concept), which offers a larger discretion to the policymaker to take into account various dimensions of power. According to Chapter 2 Section 2 of the Draft undertakings shall be designated as having a SMS, where (a) an undertaking (a) carries out a digital activity, which (b) is linked to the United Kingdom, (c) has substantial and entrenched market power and (d) a position of strategic significance.

While there is a turnover condition in Chapter 2 Section 7 (£25 billion global turnover or £1 billion turnover), the Bill attaches less significance to it than the DMA, because first, meeting the thresholds do not lead to the presumption of SMS, and second, particularly the global turnover threshold is much lower than the €75 billion required by Art. 3 Section 2 DMA. This allows for more flexibility in identifying addressees based on power dynamics, avoiding blindspots in the enforcement due to much focus on absolute economic output. While the DMA also allows for qualitative considerations in deciding on the gatekeeper status (see Art. 3 Section 6), the presumption of Art. 3 Section 2 DMA is central to the designation.

This flexibility in the designation decision also extents to the requirement of a digital activity (see Chapter 2 Section 3), which in defined in much broader terms than the minutely detailed list of core platform services defined in Art. 2 Section 2 DMA.

The UK Bill operates by obliging the designated undertakings to adhere to a code of conduct, which defines ex ante behavioural rules for the undertakings. Once again, the approach chosen by the UK Bill seems to allow for more flexibility in designing and adapting the code of conduct for the individual undertaking, thus enabling it through the use of a more bespoke/personalised regulation model to adjust its private governance tools to the concerns expressed by the regulator while retaining the necessary flexibility. While the DMA takes a 'one size fits all' approach, the UK Bill leaves the design of the conduct requirements in the discretion of regulator (see Chapter 3 Section 19 of the Bill), only providing a broader framework for this discretionary decision (see Chapter 3 Section 20 of the Bill). This would also allow for more consideration regarding the governance structures of ecosystems.

Furthermore, with an eye on the need for flexibility, the UK Bill establishes an exemption from the codes of conduct, where the benefits of a conduct breach to users or potential users outweigh the actual or likely detrimental impact on competition resulting (See Chapter 3 Section 29 of the Bill). The DMA does not provide for such an exception. The exemption is only applicable where "the conduct does not eliminate or prevent effective competition", but its effect is to provide more leeway for taking into account the specificities of each ecosystem and the positive effects of its underlying private governance arrangements.

A different approach has been taken by some hybrid competition law regimes that combine *ex ante* and *ex post*, such as Section 19a GWB (German Law against Restrictions of Competition), which came into force in January 2021. Like the DMA, Section 19a (1) GWB follows a two-step designation procedure. However, similar to the UK Bill, it does not rely on a conclusive list of 'core platform services' or quantitative thresholds. The Federal Cartel Office can designate an undertaking that operates to a significant extent on multi-sided markets

and networks, if it is of paramount significance for competition across markets. Both criteria leave more discreation and flexibility to the authority than the DMA.[295] This flexibility is also carried into the design of the 'prohibited conducts' under Section 19a GWB, which unlike the obligations imposed by the DMA, are not directly applicable. This requires a further decision by the Federal Cartel Office, which can define the respective obligations from the list of prohibited conduct for the company individually. Accordingly, these are formulated much more broadly than the case groups of the DMA and remain therefore more flexible, providing more discretion to the various business models and governance architectures of digital ecosystems[296]. Furthermore, similarly to the UK Bill, and contrary to the DMA, Section 19a (2) establishes the possibility of exception from the prohibited practices if the conduct is objectively justified, the 'prohibited' list of practices establishing a presumption of anti-competitive effects, which however can be rubtted if such effects do not exist and that the behaviour has efficiency-enhancing or pro-competitive effects. In this respect, the burden of demonstration and proof lie with the undertaking.

3. The Regulatory Analogy of the 'Uncontract': Supervisory Technology and 'Regulation by Design'

Public governance tools in the digital age cannot just rely on traditional rule-making and law enforcement, but increasingly also on 'code' to prescribe and to automatise compliance to specific forms of conduct. Similar to the 'uncontract' analogy in the context of private governance, different sets of supervisory technologies (so-called 'Suptech') and the ambition of 'regulation by design' have led to approaches in which technology is not only used by private actors in order to embed their values in ecosystem governance (code is law), but also code can be use by public actors as a regulatory mechanism to enhance the compliance of private technoeconomic systems to public values as these are expressed in legal requirements (law is code)[297]. With the development of the field of Suptech, code can be transformed to a quite effective public governnance tool, which is increasingly used as a tool to enhance continuous monitoring (of the market or ecosystem in question), and which facilitates early detection and eventually punishment for conduct that is, or risks to produce social costs. Through the use of

[295] The requirement of significant activity ensures that only companies focussing on digital business models are subject to designation. This means that companies are not covered if their activities as a platform or network either (1) only play a completely subordinate role for the company itself compared to its other economic activities or (2) if they only play a subordinate role in the relevant markets compared to their competitors (Translation of the explanatory memorandum,: https://dserver.bundestag.de/btd/19/234/1923492.pdf). The analysis of paramount significance for competition across markets is particulary based on (1) its dominant position on one or several market(s), (2) its financial strength or its access to other resources, (3) its vertical integration and its activities on otherwise related markets, (4) its access to data relevant for competition, (5) the relevance of its activities for third party access to supply and sales markets and its related influence on the business activities of third parties (see official translation of Section 19 a GWB, available here: https://www.gesetze-im-internet.de/englisch_gwb/englisch_gwb.html#p0071). For a detailed analysis see Heike Schweitzer in Immenga/Mestmäcker, Wettbewerbsrecht (2024), § 19a, Section 86 et seqq.

[296] Although the term ecosystem does not appear in the text of Article 19A GWB, the provision is very much inspired by the emergence of ecosystem competition. See, P. Hornung, The Ecosystem Concept, the DMA, and Section 19a GWB, (2023) Journal of Antitrust Enforcement jnad049, https://doi.org/10.1093/jaenfo/jnad049 .

[297] S. Hassan & P. De Filippi, The Expansion of Algorithmic Governance: From Code is Law to Law is Code, *ield Actions Science Reports*, Special Issue 17 | 2017, 88-90.

APIs and robotic-process automation (RPA), as well as more elaborate technologies involving neural networks, public authorities may develop a series of diagnostic, analytic, predictive and even prescriptive tools that may not only deter firms from breaking the law, but, if these are implemented systematically, may lead to 'compliance by design'[298]. Suptech has been particularly used so far in the context of financial regulation, anticorruption regulation and competition law enforcement[299]. However its expansion to broader areas of 'regulation by design'[300], and stages of enforcement (e.g. automated monitoring of remedies) to ensure compliance, is a matter of time[301].

E. The Public Values of Digital Capitalism: Towards a Comparative Institutional Analysis of Tools of Private and Public Governance

The analysis hitherto has highlighted the importance of institutional evolution and institutional choice – and hence 'institutional imagination'[302] – as focal points for the legal analysis of the governance of ecosystems.

We take the view that ecosystems constitute complex adaptive social systems, in which different actors (non-state, but also state) develop patterns of interaction, adapting accordingly their strategies, and from these interactions emerge punctuated equilibria, including institutions that also influence through different ways (e.g. path dependence, feedback loops) the process of change. This first calls for adopting a perspective of institutional evolution, paying attention to the way ecosystem behaviour should correlate to the instrumental values (that is values bound to some specified problem-solving) which emanate from the broader value system put in place by the social contract and/or the democratic process, rather than the internal values of the business ecosystem as these are defined by its more powerful actor(s). This recognises that any effort to inquire into processes of institutional change is an inherently normative exercise. We consider it crucial that a legal theory of digital ecosystems integrates a dynamic perspective that would avoid the usual criticisms of 'static regulation' and the 'ossification of the (legal) process'[303] and will lead to more adaptive and responsive public governance. Hence, a theory of institutional change is consubstantial to a dynamic legal theory of ecosystems. The second

[298] HCC, Inception Report, Computational Competition Law and Economics (January 2021) available at Computational Competition Law and Economics (epant.gr) .

[299] See, OECD (2021), "The use of SupTech to enhance market supervision and integrity", in *OECD Business and Finance Outlook 2021: AI in Business and Finance*, OECD Publishing, Paris, https://doi.org/10.1787/d478df4c-en.

[300] See, for instance the messenger interoperability obligation as described in the Digital Markets Act which may operate as a form of regulation by design, the technological artefact integrating the law's concern over interoperability between the gatekeeper's services and those of third parties. However, there is still some room for private governance arrangements to protect from code that could endanger the integrity, security and privacy of the gatekeeper's services, provided, however, "that such measures are strictly necessary and proportionate and are duly justified by the gatekeeper". Art. 7(9) DMA.

[301] World Bank Group, The Next Wave of Suptech Innovation – Suptech Solutions for Market Conduct Supervision (March 2021).

[302] R. Unger, 'Legal Analysis as Institutional Imagination', (1996) 59 Modern Law Review 1.

[303] The ossification of the rulemaking process because of elaborate procedural steps and extensive judicial scrutiny as barriers tot he exercise of the rulemaking authority by US agencies: see, T.O. Garity, Some Thoughts on 'Deossifying' the Rulemaking Process, (1992) 41(6) Duke Law Journal 1385. Static regulation is linked to the lack of consideration of the inter-temporal aspect of regulation and the need to focus on innovation. See, E.E> Bailey, Innovation and regulation, (1974) 3(3) Journal of Public Economics 285.

emphasises the need for a comparative institutional analysis, modified in order to take into account the complexity of the institutional choice in the presence of ecosystems and the important social impact such institutional choice may produce.

1. Tracing 'Regressive' and 'Progressive' Institutional Change

Explaining the distinction between ceremonial and instrumental values, Paul Bush notes that "(t)he institutional structure of any society incorporates two systems of value: the ceremonial and the instrumental, each of which has its own logic and method of validation"; From one side, ceremonial values "correlate behavior within the institution by providing the standards of judgment", these being largely based on tradition, accepted as authority and regarded as absolute, to the extent that is beyond critical or scientific scrutiny[304]. From the other side, instrumental values "correlate behavior by providing the standards of judgment by which tools and skills are employed in the application of evidentially warranted knowledge to the problem-solving processes of the specific community, and "are validated in the continuity of the problem-solving processes"[305]. In contrast to ceremonial values, instrumental values are not 'fixed or immutable', the problem-solving processes in a community being inherently dynamic and dependent on the evolution of knowledge and technology[306]. A behaviour may possess both instrumental and ceremonial characteristics (it is 'dialectic'), which adds to the complexity of forms that behaviour patterns may take[307].

Different patterns of institutional behaviour therefore emerge, some of them being ceremonially warranted, while others instrumentally warranted. Bush however acknowledges that instrumental valuation cannot "rationalise purely ceremonial behavior"[308], which raises the risk that instrumental behavior may be absorbed and captured by ceremonial valuation. In these instances of 'ceremonial enclosure', 'instrumental behavior' is 'encapsulated' within a ceremonially warranted behavioral pattern, thereby incorporating instrumental behavior in a ceremonially prescribed outcome"[309]. Ceremonial encapsulation may give rise to 'ceremonial dominance', that is a situation in which ritualistic language will block any evolution of the institution towards a logic that would be more compatible to instrumental values, and which would be correlated to a specific problem-solving process, with the result that the system in question will be locked into an institution for longer than instrumentally justified (or efficient)[310]. Ceremonial dominance poses thus an obstacle to the absorption and diffusion of new technologies or new ways of thinking about the common good, and which would have integrated the instrumental values of the specific society (and social contract) as these evolve[311].

This discussion leads Bush to conclude that there are two forms of institutional change: a regressive and a progressive one. Regressive institutional change leads to "the absolute

[304] P.D. Bush, The Theory of Institutional Change, (1987) 21(3) Journal of Economic issues 1075, 1079.
[305] Ibid., 1080.
[306] Ibid.
[307] Ibid., 1081.
[308] Ibid., 1083.
[309] P.D. Bush, The Theory of Institutional Change, 1084.
[310] P.D. Bush, The Theory of Institutional Change, 1085-1086.
[311] P.D. Bush, The Theory of Institutional Change, 1093.

triumph of imbecile institutions over life and culture" (or technological and social progress), "causing the displacement of instrumentally warranted patterns of behavior by ceremonially warranted patterns of behavior, thereby raising the index of ceremonial dominance in the community"[312]. Progressive institutional change brings an "increased reliance on instrumental values in the correlation of behavior within the community, thereby lowering the index of ceremonial dominance", enabling the continuous incorporation of new knowledge in the problem-solving processes[313], but also improving "the ability of the members of the community to understand and adapt to the changes in habits of thought and behavior entailed by technological innovations", which affects positively the timerate of both the adoption and diffusion of innovations[314]. Bush notes the role of the democratic and decentralised process (the importance of experimentation, participatory democratic negotiation, deliberation, and community building) in nurturing instrumental valuing and progressive institutional change[315]. In contrast, individualistic or hierarchical cultures may more easily lead to 'endogenous institutional degeneration' towards situations of ceremonial domination[316].

Transposing this discussion to the study of the limits of the private governance of ecosystems, an important concern of a system of public governance should be to avoid the rise of situations of ceremonial dominance, in which technological and social progress becomes ossified because of the encapsulation of instrumental values by ceremonial ones. This may even occur for institutions that initially emerged through an instrumental logic, for instance, to solve problems of coordination in systems comprising independent co-producers of value. However, due to the power asymmetries, the central positioning of Big Tech firms, and the resource dependence of the complementors, in the absence of possible alternative ecosystems (inter-ecosystem competition), such ecosystem characterized by ceremonial encapsulation may survive and continue to develop. The interaction system will support continuous exploitation, as the dominant player (e.g. the ecosystem orchestrator) will still manage to keep its subordinates (complementors) cooperating, even if receiving less of the joint surplus value produced by the joint innovation effort[317]. Hence, even if initially efficient and economic value-generating at some point, an ecosystem may stop providing an efficient solution to the problem of organizing the process of co-creating value and of the optimal distribution allocation of the surplus value resulting from the effort of joint production and innovation. Ensuring that an external (to the ecosystem) agent (a disruptor, or institutions of public governance) may intervene and steer this private ordering away from ceremonial values to be more responsive to the instrumental values of the community of stakeholders will certainly avoid the degeneration towards ceremonial domination and will promote the likelihood of progressive institutional change.

[312] P.D. Bush, The Theory of Institutional Change, 1100.
[313] P.D. Bush, The Theory of Institutional Change, 1101.
[314] P.D. Bush, The Theory of Institutional Change, 1105.
[315] P.D. Bush, The Theory of Institutional Change,1108.
[316] See, the comments by W. Elsner, T. Heinrich, H. Schwardt, The Microeconomics of Complex Economies (Elsevier, 2015), 410 & 412.
[317] W. Elsner, T. Heinrich, H. Schwardt, *The Microeconomics of Complex Economies* (Elsevier, 2015), 407.

2. Institutional Choice and Modified Comparative Institutional Analysis

With regard to the question of institutional choice, a broader framework than that of (allocative, productive, dynamic or transactional) efficiency, namely one which would engage with broader public values is needed. Here, the goal is to assess the *optimality* of the governance arrangements of the ecosystem *in the specific situation*, minimizing the risk to fall into some form of bias. This framework will accept the GVC focus on the different economic and social actors in the value chain(s), and the emphasis put on the degree of their participation in the process of value generation and capture. This approach recognizes that each of the private or public governance regimes may have their advantages and disadvantages[318].

In his theory of comparative institutional analysis, Neil Komesar has emphasised the primary role of institutional choice, that is the selection of the social decision-making process that would dispose the residual right of decision-making in a specific context, in order to deal with various externalities/policy problems[319]. Komesar distinguishes between legislatures (the political realm), courts (adjudicators) and markets. Beyond this initial scope, it is possible to apply his analysis to various other intermediary social (public or private) decision-making processes, such as State owned companies regulating by ownership, State bureaucracy or independent regulatory authorities regulating ex ante through command and control prohibitions enabling different degrees of flexibility, independent regulators/competition authorities enforcing competition law liability rules ex post, specific corporate governance regimes mandated or provided as an option by the State, State courts as institutions of enforcement of private governance tools, private self-regulation bodies, community/ecosystemic rules and standards imposed through different regimes of private governance (including corporate social responsibility regimes), market agencements[320], as well as an hierarchy within a digital platform firm imposing corporate values to its various institutional components. This broad perspective on the availability of institutional choice should be accompanied with a broader understanding of the public values that need to be embedded in the governance institutional choice of ecosystems. Different public values (e.g. contestability, fairness, innovation, sustainability, security, public health, democratic

[318] See, for instance, the recent empirical research by S. Thatchenkery & R. Katila, Innovation and profitability following antitrust intervention against a dominant platform: The wild, wild west?, (2023) 44(4) Strategic Management Journal 943 (performing an ex post analysis of competition law interventions regarding digital platforms and finding that antitrust intervention (public governance) in digital ecosystems produced benefits for innovation although it also led to an increase of the profitability risks for digital platforms and may lead, in the absence of the 'order' and 'discipline' provided by the dominant digital platform, to the development of 'wasteful efforts' that hurt the financial performance of the ecosystem). See also, Y. Zhang, J. Li & T. Tong, Platform governance matters: How platform gatekeeping affects knowledge sharing among complementors, (2022) 43(3) Strategic Management Journal 599 (noting how platform's gatekeeping policies may provide a useful disciplining force, 'weeding out' (low-quality) flowers that may not benefit the ecosystem as a whole).

[319] N. Komesar, Imperfect Alternatives: Choosing Institutions in Law, Economics and Public Policy, (University of Chicago Press, 1997); N. Komesar, Law's Limits, (Cambridge: Cambridge University Press, 2001).

[320] As Callon reminds us the market is not asocial and one should situate market transactions "within the entire set of material and textual devices" (including the legal regimes) that structure and prompt commercial activities: M. Callon, *Markets in the Making – Rethinking Competition, Goods and Innovation* (Zone Books, 2021), 49. These "market agencements" do not only rely on "market devices" but also result from the contribution of the legal regime/technology coding that structures and prompts economic activity.

accountability, media pluralism, digital sovereignty etc.) may be achieved by the intermediary of these institutional processes, and institutional processes inevitably will affect outcomes.

The joint emphasis on progressive institutional evolution and adequate institutional choice has various implications. The first is that the choice of the adequate institutional process, from the ones listed above, cannot be done *in abstracto* and from a static perspective, but should rely on regulatory experimentation and take a dynamic approach that would adequately take into account the number, but also the complexity of the matters to be decided by these processes[321]. It follows that such institutional choices will "define the terms of legal analysis, not the other way around"[322]. Such an approach would abandon the "simplistic associations of goals and institutions"[323] and would argue that institutional choice should become the focus of the analysis.

These institutional choices can of course be viewed in "welfare terms" (e.g. the efficiency, fairness, sustainability-oriented operation of a particular institution) "*and* in participatory (and inclusivity) terms" (regarding the quality and extent of participation of all affected stakeholders in the decision-making processes at issue)[324], the assumption being that "institutional processes mediate the articulation of individual preferences"[325]. These can be characterized as overall procedural requirements that place some general constraints as to how governance/institutional choices should be made. Here, participation would mean that the participatory interests of all those contributing to the generation of ecosystemic value should be considered. As this approach focuses on institutional choice, it accords particularly well with recent scholarship on legal institutionalism as well as the Law & Political Economy synthesis, which seek to foreground macro-level perspectives, including the constitutive role of law for the political economy of digital capitalism, for politico-legal 'background rules' that shape the specific institutional choices made regarding the regulation of digital markets and ecosystems.[326]

The second implication is that the choice of the institution that will balance the costs and benefits (if this is the chosen decision rule) should be the result of a comparative analysis, rather than a single-handed assessment focusing only on the costs and benefits of a specific intitution. Institutions are alternative mechanisms by which societies carry out their goals. Each of them presents specific limits and imperfections and the decision over the most optimal institution should result from a comparative cost benefit analysis of all the alternative institutional choices with the aim to select the least imperfect one. In the presence of market failures, a single institutional analysis would immediately conclude that, for instance, the courts

[321] Komesar's analysis suggests a shift in the choice of the adequate institutional process as numbers and complexity increase.
[322] Ibid., p. 19. See, also p. 175: "[…] (V)irtually nothing follows from the choice of a goal. You cannot hardwire goals and institutions and, therefore, no program of law and public policy follows from goal choice. The simple correlations between goals and institutions that characterize so many ideological positions simply do not hold"
[323] Komesar, N. (2001), Law's Limits, op. cit., p. 175.
[324] Schaffer, G. & Trachtman, J. (2011), 'Interpretation and Institutional Choice at the WTO' Virginia Journal of International Law 52(1) 103-153, p. 106.
[325] Komesar, N. (2001), Law's Limits, op. cit., p.152.
[326] Eg J. Britton-Purdy, D.S. Grewal, A. Kapczynski & K. Sabeel Rahman, Building aLaw-and-Political-Economy Framework: Beyond the Twentieth-Century Synthesis, Yale Law Journal 129 (2020), 1784; for European perspectives cf A. Beckers, K.H. Eller, P. Kjaer, The Transformative Law of Political Economy in Europe – An Introduction, European Law Open 1 (2022) (and the contributions in the respective Special Issue).

or the legislative process should intervene, and in the presence of a government failure, it would opt for the market as being the adequate institutional choice. In contrast, comparative institutional analysis will assess all alternative institutional options, proceeding to a comparative analysis of their costs and benefits, before any decision is made. According to Komesar, "we must confront the reality that the best choices will be highly imperfect and that the relative merits of institutions will vary across different settings"[327]. None of these institutional choices is perfect from the perspectives of social welfare maximisation, distributive fairness or the direct and indirect participation in decision-making of the affected stakeholders. Under each alternative, stakeholder positions will be reflected and affected in different ways.

The third implication is that different interpretive choices can be analyzed using a comparative institutional analytic method that focuses on the relative implications of interpretive choices for example, for welfare and participation. Here we may modify Komesar's analysis and add other prescriptive norms or procedure requirements than efficiency and participation, as this is required by the social contract in a specific polity, such as transparency, integrity, accountability, representativenss, openness, innovativeness, efficiency and effectiveness, adaptivity, responsiveness, legitimacy[328]. The allocation of institutional responsibilities always turns upon a judgment about which of the candidate institutions is, when compared to the other candidates, best suited to the job. Hence for the problem of the governance of digital ecosystems to which we are here confronted, we need to compare different institutions in addition to the "natural order" of the market: (a) the ecosystem with the central role of the ecosystem orchestrator, (b) a more decentralised ecosystemic network or layered governance model for collaborative ecosystems, such as a stakeholders' council to which, along orchestrators and complementors, also users are represented, (c) a hybrid public/private governance regime (code of conduct) administered by an ombudsman, (d) the competition authority and courts involved in ex post abuse control and resorting to effects-based balancing regarding some parameters of welfare or sustainability, (e) a self-regulation regime, or (f) a public/private governance hybrid involving transparency regulation, (g) a bespoke regulatory regime ensuring regulation through codes of conduct, (h) a regulator interfering ex ante, with specific behavioural or performance criteria or on the basis of broader or narrower prescriptive values, norms, and principles striving to mitigate various power dynamics, to cite a few institutional options. This comparative institutional analysis should analyze in all of these institutional options according to the selected procedural requirements, such as social welfare maximisation, distributive fairness or the direct and indirect participation in decision-making of the affected stakeholders, not only focusing on the advantages and pitfalls of a specific instutional choice, but also in a comparison with those of another institutional alternative. It is important here to add that cost benefit analysis is not the only decision rule available, but one may also make use of other decision rules such as the precautionary principle or a version of the maximin rule[329].

[327] Ibid., p. 189.
[328] Tom Pieter Matthijs Bastiaans (4606477): The Governance of Collaborative Ecosystems (2022), 52 et seq.
[329] The precautionary principle will accept short-term losses in order to avoid long term significant losses for which there is not a known probability distribution in terms of frequency. The maximin rule we will choose whatever alternative institutional arrangement will maximize the minimum (words) outcome of a particular

Hence, from our perspective, the sole focus on the dynamic (and/or ordinary) capabilities of a Big Tech orchestrator is quite reductionist and suffers from the fallacy of the single institutional analysis, if this is not accompanied with a comparative analysis of the dynamic (and/or ordinary) capabilities of the complementors which contribute to the co-creation of ecosystemic value (as ecosystems are collaborative). A simple focus on the benefits and shortcomings of the private governance arrangements of a specific ecosystem will also suffer from the same weakness of single institutionalist analysis if it is not accompanied with a comparative institutional analysis of the benefits and shortcomings (in terms of capabilities, resources, learning, accountability, effectiveness) of public governance arrangements, such as a competition authority or a court, which may of course be different from jurisdiction to jurisdiction (for instance, because of different institutional capabilities to deal with the complexity of ecosystems). A simple focus on a specific public governance arrangement, such as competition law liability rules applied ex ante, will also be committing the fallacy of single institutionalism, if it is not accompanied by the analysis of other regulatory options, such as an ex ante regulatory regime etc, again integrating efficiency considerations (such as the institutional capabilities of the various state actors involved) and/or the participation and inclusion of all stakeholders' interests (including of course those of the regulated digital gatekeeper or strategic status undertaking). More work needs to be done on this modified comparative institutional analysis and apply this to specific problems[330].

Our analysis has shown the difficulty faced by private governance regimes (including self-regulation), and to a certain extent by light-touch public governance tools that leave an important space for private governance tools, such as contract law, but also to a certain extent competition law, to cater for the important variety of social costs engendered by the phenomenon of digital platforms, and argued for the importance of ensuring a progressive institutional evolution and an institutional choice that follows an elaborate comparative institutional analysis. In our view, as authorities gradually recognise the complexity of the task, they are turning to a 'toolkit approach' combining different public and private governance mechanisms[331]. The availability and 'dosing' of the different tools depends, first, on the complexity of the problem/externalities to be addressed, which is influenced by the public values put forward in the social contract each polity, and the efficiency/effectiveness of the institutional capabilities and resources available for each institutional choice. This shows that these institutional choices may vary from jurisdiction to jurisdiction, and they may change according to the evolution, among others, of public values or of the institutional capabilities available. This multi-jurisdictional institutional experimentation may also be source of significant policy learning that may alter the comparative institutional analysis performed, or the choice by each polity of the adequate procedural rules, decision rules and public values to be embedded in regimes of public and private governance of digital ecosystems.

choice. On the pecautionay principle and ist distinction from other decision rules, such as cost-benefit analysis, see D. Steel, *Philosophy and the Precautionary Principle – Science, Evidence, and Environmental Policy* (Cambridge Univ. press, 2015).

[330] For further analysis, see I. Lianos, *Polycentric Competition Law: a Competition Law for a Complex Economy and Society* (forth. 2025).

[331] See also I. Lianos, Competition Law for the Digital Era: A Complex Systems' Perspective (August 30, 2019). Available at SSRN: https://ssrn.com/abstract=3492730 .

VI. Conclusions

This study has undertaken an analysis of the modes and techniques of private governance as currently deployed in leading platforms of different sectors and geographical origin, to back the argument that private governance is "made", not "given" to implement a 'natural order'. The comparative analysis of the private governance tools in existing platforms allows a series of conclusions to be reached regarding their influence on ecosystem development and design.

Digital ecosystems may put forward private governance regimes, either collaboratively through some form of self-regulation, or by a platform leader/keystone firm imposing certain *de facto* standards of interaction. These do not only aim to improve efficiency but also to *regulate* the various social costs emerging out of the expansion of ecosystems, with the aim to avoid stricter government oversight (through a public governance regime)[332]. Relying only on private governance regimes does not, however, effectively respond to the concerns that ecosystems may be sources of an important number of broader externalities (at the ecosystemic level or that of society) which are not adequately addressed by institutions of private governance. For instance, their sheer size in the global economy raises systemic risks as they exercise an important power that remains largely unchecked from competition and this enables some central/keystone actors to capture 'unfairly' the most important part of the surplus value brought about by the collective innovative effort of all participants to the ecosystem.

To address these concerns, one may adopt different strategies of public intervention (public governance mechanisms). Non-discrimination, neutrality-enhancing policies, or policies against abusive termination by a platform may limit the risks of self-preferencing and foreclosure, while access duties to the parts of the platform considered to be like 'essential facilities' or a bottleneck could protect the ability of the platform's partners to develop competing offers (to those of the platform's subsidiaries) in other segments of the digital value chain. One may also select a hybrid strategy and put in place institutions of private governance with countervailing powers, such as unions of intermediary or end-users, trade unions that represent the self-employed in the gig economy (like Netflix artists and Uber drivers), whistleblowers and leaks, or enhance the cooperation of media companies so as to collectively bargain with, and thereby tame the power of Big Tech platforms.

The study eventually provided an analysis of the (un)suitability of the traditional tools of competition law and contract law to deal with challenges that emerge from complex governance structures in the digital economy. An overview of new regulatory tools and initiatives revealed that most often they do not consider the relative novelty of public governance structures in the digital economy and the need to perform a comparative institutional analysis of the alternative institutional choices on offer with the aim to ensure progressive institutional change. Exposing that private governance mechanisms are not 'natural' but are purposefully designed, and that the risk of degeneration towards ceremonial domination and regressive institutional change looms, this study showcased the limits of

[332] M. Cusumano, A. Gawer, D. Yoffie, Can Self-Regulation Save Digital Platforms?, Industrial and Corporate Change, 2021.

private governance of ecosystems and the importance of embedding these in institutions of public governance that would sway ecosystem stakeholders towards interactions that offer greater social value, as this is defined by the social contract of the specific polity.

By defining the contours of a legal theory of ecosystems the study differentiates itself from the more reductionist scope of existing business studies and Industrial Organization/economics theories of ecosystems. The business studies literature merely explores the research question of how to harness (private) value for the participants in a business ecosystem, and in particular, the ecosystem orchestrator, addressing issues of allocation of the surplus value only to the extent these would limit the specific business ecosystem's value potential. Broader social value issues, particularly the impact on external to business ecosystem actors, did not form part of the discussion, at least until recently. Some promising recent literature has attempted to provide a broader theory of "ecosystem externalities" or "ecosystem failures" that may eventually justify the intervention of competition authorities, to ensure the broader social (and not just ecosystemic) value generated by business ecosystems, but this effort has not yet reached intellectual maturity[333]. The integration of the concept of the ecosystem in the competition law toolkit has also led Industrial Organization ("IO") and other experts to explore the contours of the concept and possible ecosystemic theories of harm that may be taken on by competition authorities to initiate *ex ante* or *ex post* competition law interventions.[334] This literature is however still embryonic and largely relies on the economic theory of competition, without, for the time being, any effort to develop a corresponding theory of co-opetition that would be adequate to assess the social costs and benefits of business conduct in a connexionist world[335]. This literature still tries to fit the ecosystem concept in the existing narrow conceptual framework of IO economics, without however attempting to engage with the study of ecosystems as a distinct institution of economic ordering than markets and other economic organizations, which has profound implications for the process of value generation and capture in modern capitalism, as well as the conceptualization and measurement of power positions (economic, but also any other dimension to which economic power may be converted) in ecosystems and more broadly. It does not also make any effort to link the study of ecosystems to the broader conception of the public good, integrating social and environmental sustainability concerns, polyarchy, and democracy, which forms the essence of the emerging new mainstream of polycentric competition law paradigm.[336]

To embrace the full potential of business ecosystems as an institution producing social value, one needs to abandon the narrow lenses of business studies and IO literature, and adopt

[333] See for instance, M.G. Jacobides, C. Cenammo & A. Gawer, Externalities and complementarities in platforms and ecosystems: From structural solutions to endogenous failures, (2024) Research Policy 104906.
[334] See for instance, on *ex post* enforcement, M. Jacobides & I. Lianos, Ecosystems and competition law in theory and practice, (2021) 30(5) *Industrial and Corporate Change*, 1199; On *ex ante* enforcement, C. Cafarra & A Galeoti, Ecosystem theories of harm in digital mergers: New insights from network economics, VoxEU.org, Parts 1 and 2, (2023).
[335] See, for instance, the criticisms of G. Dagnino & G. Padula, Co-opetition Strategy – A New Kind of interfirm Dynamics for value Creation (EURAM, 2002); G.B. Dagnino, G.B. Coopetition strategy: a new kind of interfirm dynamics for value creation. In Dagnino, G.B. and Rocco, E. (eds.), *Coopetition Strategy: Theory Experiments and Cases* (Routledge, 2009) 25-43.
[336] I. Lianos, Polycentric Competition Law, (2018) 71(1) Current Legal Problems 161.

a broader perspective (that of Complex Adaptive Social Systems or Law & Political Economy), to the extent that having been transplanted now into law, the concept needs to adjust to its host.[337] This also calls for the development of an overarching legal theory of ecosystems. The approach resonates with recent legal institutionalism approaches taking the entanglement between legal and economic institutions and formations (and the shallow understanding that both have of one another) as a starting point. Responding to the evolutionary economics focus on innovation, such theory should not attempt to eternalize an institutional status quo, the institutional response (regimes of public and private governance) being responsive to the social needs in the specific polity and open to institutional change, avoiding ceremonial encapsulation to norms and values of the past. It cannot also abstract from the public values enshrined in the social contract in the specific polity, the institutional capabilities of the respective institutions of public and private governance, following a comparative institutional analysis, and accounting for different decision procedures than cost-benefit analysis, such as the principle of precaution and/or the maximin rule.

[337] A theory of (legal) translation is essential to understand the integration of economic transplants in law. See I. Lianos, Lost in Translation? Towards a Theory of Economic Transplants, (2009) 62(1) Current Legal Problems, Volume 346.