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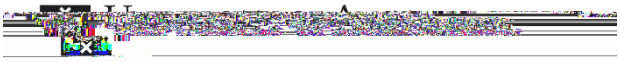

TOWARDS A LEGAL THEORY OF DIGITAL ECOSYSTEMS

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Current discussions on digital ecosystems often adopt a ‘natural order rhetoric’, assuming the superiority of private order

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

(product B) is not sufficient for the emergence of ecosystems[18] T

governance patterns, and thereby 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[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

with the entrepreneurialnnovation generated

A number of

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 cost 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 offset 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]

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

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 highlights 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 motivated, 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

strengthens their power position and enhances their value capture. This rhetoric also has direct

State etc.).[94] This set of actors can be labelled the value ecosystem in a sensu lato. Capabilities (either dynamic or ordinary) may thus not only be associated with leading 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 '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 end-users (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

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 to the same avoid situations of 'ceremonial dominance' that may lead to situations of innovation sclerosis and exploitative lock-in (see Section V.).

From this perspective, the expansion of (digital) ecosystems in different socio-economic and cultural spheres powered by network effects does 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 network markets (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 ,

broader value communities that are engaging in this 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.

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

What is however missing

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, their quality being stabilized by conventions and standards defined at the level of the value chain, the ecosystem value (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 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. a 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

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

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.

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 p	Transparent p	Informal p	Low p	Finance p	Learning p
Relational Governance	High	Opaque	Formal	High	Data	Deterrence
Captive/ Intrusive governance						

This typology

principles related to the rule of law, such as the provision of grounds for 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, such as pricing,[155] 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 7.1: "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

ecosystem.[161] These actors are therefore able to restrict the functioning of third-party products and services through the imposition of certain technological restrictions, thereby 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

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[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.

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

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 personal 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

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

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 caselaw 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. Although, 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

2. Institutional Automation under Big Data: The µncontract ¶

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

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

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 ecosystem 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

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

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 dh 0 0 1 508.78 1

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 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]

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.

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].

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

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 more diverse architectures of digital ecosystems[296]. Furthermore, similarly to the UK Bill, Section 19a (2) GWB 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 rebutted 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

APIs and robotic

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. 7 U D F L Q J s V \ V 5 M H U ¶ H D Q G µ 3 U R J U H V V L Y H ¶ L Q V W L W X W L R Q D O & K D Q J H

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 they are 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]. Any behaviour may possess both instrumental and ceremonial characteristics ('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 values. 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 contracts) 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.

2.

or the legislative process should intervene, and in the presence of a government failure, we would opt for the market as being the adequate institutional choice. In contrast, a 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 maximization, 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, such as efficiency and participation, as this is required by the social contract in a specific polity, such as transparency, integrity, accountability, representativenss, openness, inclusiveness, efficiency

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

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

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.